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TEXTILE WORLD RECORD

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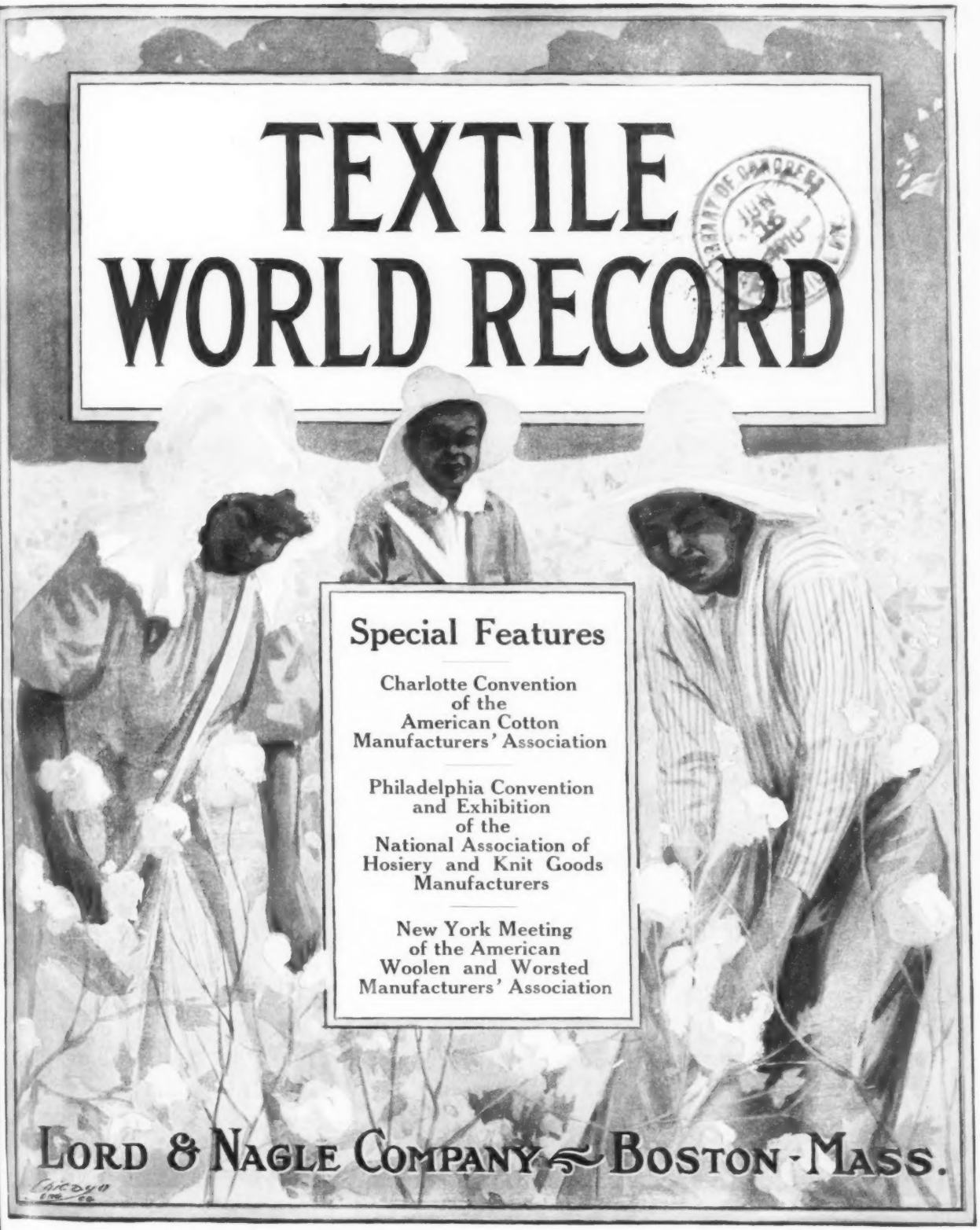

Special Features

Charlotte Convention of the American Cotton Manufacturers' Association

Philadelphia Convention and Exhibition of the National Association of Hosiery and Knit Goods Manufacturers

New York Meeting of the American Woolen and Worsted Manufacturers' Association

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Correspondence.

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

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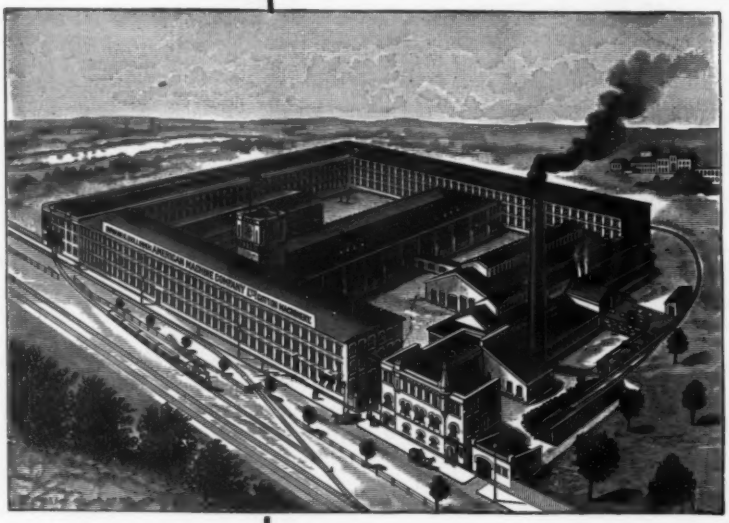

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TEXTILE WORLD RECORD

COMBINING

The Textile World and Textile Record.

VOL. 39 (NEW SERIES.) June, 1910 No. 3

Monthly Comment.

Raising Cotton.

We have been trying for several years, with indifferent results, to convince Lancashire that the best way to increase the world's cotton crop is raise more cotton in the American cotton belt. Lancashire has been stubborn, rejecting our advice, obscuring our arguments with irrelevant observations, and clinging to the idea that the best place for raising cotton by Britons is under the British flag. While we have been unable to remove this provincial idea from the Lancashire mind there have been signs recently that we have begun to make an impression. We are, therefore, encouraged to give a practical illustration of the opportunities the South offers to farm hands in raising cotton.

At Sunny Side, Ark., O. B. Crittenden & Co. have an extensive plantation devoted to cotton growing. The land is leased in small parcels to Italians, of which a large colony has located there. When we visited Greenville, Miss., with the European cotton excursion in 1907 we met Leroy Percy, the representative of Crittenden & Co., and who was recently elected Senator from Mississippi. Mr. Percy told us about the Sunny Side plan, and soon after our return sent us a statement taken from Crittenden & Co.'s books, giving the names of the Italians on the plantation, the number of acres worked and the cash received by each for the years 1904, 1905 and 1906. When sending this statement Mr. Percy wrote as follows:

The list just gives the names of the Italians, the number of acres worked by each, and the amounts paid to them after they had paid their rent and whatever supply bills they owed the firm of O. B. Crittenden & Co., such supply accounts often including mules, implements, etc., purchased by them. The list also shows the page of the book on which it is found.

We had the statement made up for our own information, and were somewhat surprised at the magnitude of the amounts paid, although we knew that they had received large amounts of money each year. Of course some tenants upon the property did not pay their accounts and some just paid their accounts.

Sunny Side, as you probably know, is situated in Chicot County, Arkansas, about 15 miles below Greenville, and we have cultivated about 5,000 acres on the property. The showing is wonderful, as demonstrating what unskilled labor can do in the South. We are prepared to give you any information that you wish in reference to it.

Following is the statement accompanying the letter:

Amount paid to Italians in cash in crop of 1906 above all supplies and rent charged to them:

Page Ledger	Name.	No. Acres	Amount.
1	Susanni Allesandra	36	$ 198.36
3	Georgini Antonio		344.29
6	Bonchetti Achelli	33⅛	23.70
8	Alpa Allisandro	20	966.54
9	Catalina Achelli	31	592.77
11	Vignoli Agusto	19	5.66
13	Mandolini Antonio	16	480.68
14	Olivar Alfonso	38¼	504.63
15	Rotatori Allesandro	18	428.50

16	Rossini Agusto	25	746.41
17	Silverstreni Allesandro	19⅛	459.90
18	Poteti Antonio	26½	928.34
8	Luigi Baccusi	25	502.64
11	Cezaro Bonvini	26¼	682.44
13	Geovanni Bonvini	18	156.39
5	Serofini Catalini	33¼	696.81
1	Angelleto Dominico	27	1,090.84
3	Antonio Duristanti	19	393.82
7	Vincenzo Duristante	26¼	858.74
3	Petro Fratesi	28½	555.82
8	Pieroni Fidelli	24¾	234.96
11	Serofini Frateni	36	277.75
12	Cezari Frateni	31	399.69
14	Scucci Francesco	14	481.87
15	Bellitinni Francesco	11	177.73
16	Greanti Francesco	29	960.42
1	Lamandini Guleleno	26½	262.95
6	Francessini Gulelino	24	545.60
10	Fracossi Guisippi	18	868.61
20	Pusanti Gulelimo	12½	252.86
21	Polidori Giovanni	24¼	894.66
6	Pieorni Leopoldo	21½	536.29
1	Zampini Mariah	15	12.00
2	Chas. Mariangoni	12½	534.22
5	Giovanni Mangorelli	16	107.55
1	Agnoletti Nozarenno	16¾	248.14
3	Frateni Mazareno	28	530.89
9	Cosavocci Nazareno	23¾	271.03
12	Coroloni Nazareno	21½	510.92
13	Greganti Nazareno	37¼	1,173.99
14	Siena Nazareno	25	1,157.58
15	Gerolomette Nazareno	25	878.67
16	Gulinelli Nazareno	17	810.80
1	Santini Osualdo	16	176.15
2	Cezarenni Oresto	15¼	338.65
4	Manzini Phillipi	15	145.16
5	Giovanni Papelio	15½	313.72
6	Zampi Pietro	23	749.36
7	Gesolini Paolosini	13¼	527.04
8	Papelio Satrennia	18½	120.73
10	Alberto Parenti	24¼	494.59
11	Eduardo Paolosini	29	565.50
12	Guisippi Pireoni	19	728.36
2	Reginelli & Co.	30¾	201.71
5	Reginelli Rosa	14	344.57
6	Reginelli Antonio	24	692.77
1	Zack Simmonetti	42½	103.20
2	Torigoni Silvini	35	534.79
6	Regnelli Silvini	26½	491.71
7	Maucini Serofini	15	41.46
9	Nicola Stupendo	17	339.60
10	Lectrici Silverstreni	23	563.46
13	Eduardo Silverstreni	13¾	284.55
14	Giovanni Silverstreni	16½	146.05
15	Fred Sparcorelli	22	740.83
1	Mingorelli Ubaldo	12½	105.01
3	Ludwicio Visconi	23½	413.60
4	Valorio Valbreanni	20	364.20
5	Vifori Andriola	24	693.90
6	Vincenzo Brunetti	26	951.95
	Lanis Zucone		151.00
	71 Tenants	1,536¼	$34.454.02

In reply to our letter of inquiry Senator Percy wrote us last month that the Italians are still working on the Sunny Side plantation, and were never so prosperous and satisfied as during the past two years. We submit this exhibit for the benefit, not only of Lancashire, but of Europe.

Minnesota Wool.

We recently received the following letter from Magnus Brown, president of the Minnesota Sheep and Wool Growers' Association:

Farmington, Minn., May 17, 1910.

Editor Textile World Record:

My dear Mr. Dale: Enclosed you will please find a statement of Prairie View Flock of grade Shropshires, which I wish you would publish. I am personally acquainted with this man and can vouch for his industry. You can readily see that this is not figured on a basis of profit that any other business would stand.

Magnus Brown, President.

The statement which Mr. Brown enclosed is as follows:

PRAIRIE VIEW FLOCK GRADE SHROPSHIRE SHEEP OWNED BY F. A. THOMAS, FARMINGTON, MINN.

January 1st, 1909, per inventory.

114	breeding ewes	@ $3.50	$519.00	
101	lambs	" 3.00	303.00	
4	bucks	" 15.00	60.00	
				$882.00

January 1st, 1910, food consumed for year.

20	tons 1st crop clover and timothy hay	@ $4.00	$80.00	
7	tons 1st crop clover and timothy hay	" 5.00	35.00	
2	tons 2nd crop clover and timothy hay	" 6 00	12.00	
15	acres fodder corn in stack @ per acre	8.00	120.00	
20	bush. barley at 55c bush.		11.00	
40	acres pasture rented		85.00	
4	bbls. salt	" 1.20	4.80	
1	wheat straw pile		5.00	
2	clover straw piles	" 10.00	20.00	
219	sheep running on grain fields in spring, 30 days at 5c per head per day		32.85	
240	sheep and lambs feeding in stubble fields and hay land on 120 acres 60 days at 5c each		72.00	
				477.65

Labor taking care of flock for year.

Winter feeding, 1 hour per day man and team, 150 days @ 30c. per day	$45.00
Care of sheep at lambing time	12.00
Taking sheep to pasture and yarding ½ hour per day for 100 days @ 10c per day	10.00
Trimming and docking lambs, dipping and sorting sheep and lambs, 2 men 3 days @ $2.00	12 00

Shearing 213 head @ 10c each	21.30	
Boarding men 3 days at $1.00	3.00	
		103.30

Sundry Items.

Taking 49 head sheep to So. St. Paul	5.00	
Comm. and yardage on same	11.04	
Hauling wool to station, ½ day	1.50	
Freight on wool	1.52	
6 gals. sheep dip @ 60c	3.60	
Interest 1 year on $882.00 original flock @ 7%	61.74	
Interest 1 year on $200.00 worth of fence at 7%	14.00	
" 1 year on 100.00 sheep shed	7.00	
1 dead sheep	3.50	
4 dead lambs @ $3.00	12.00	
1 dead buck	15.00	
		134.90
		1,597.85

Proceeds from sales and otherwise from flock for the year.

47 yearling wethers		183.74	
1 sheep		5.40	
2 lambs		5.50	
1 sheep		1.50	
1 ram		8.00	
54 lbs. wool @	.30	16.20	
13 " " "	.22	2.86	
156 " " "	.26	40.56	
1000 " " "	.29	290.00	
1 " " "	.23	.23	
11 " " "	.28	3.08	
3 " " "	.33⅓	1.00	
Premiums on wool at Fairs		4.00	
80 loads manure @ 75c		60.00	
Value from sheep eating weeds and fertilizing 120 acres @ 10c per acre		12.00	
			634.07

January 1st, 1910, per inventory.

100 breeding ewes @	$5.00	$500.00	
24 " " "	4.00	96.00	
22 " " "	2.50	55.00	
12 yearling wethers	5.00	60.00	
2 rams	15.00	30.00	
80 lambs	4.00	320.00	
			1,061.00
			$1,695.07
			1,597.85
Net profit for year			$97.22

This statement from Mr. Brown is an interesting contribution to the current discussion of the wool supply. Incidentally it suggests the marked contrast between the government's care of the cotton crop and the official neglect of the wool clip. For years the Washington government has watched over the cotton crop, spending large sums of money for a system that includes estimates of acreage, time of planting, weather conditions, growth of the plants, combatting pests and blight, progress of picking and ginning, and the gathering of statistics. As for wool the beginning and end of the fostering care of the government is practically included in the placing of a specific duty on that material. What is needed is an equalization of the official care for these two important textile fibers.

Safeguards.

There is no more important duty in manufacturing establishments than the prevention of accidents to the workers. It should be the first consideration on the part of operatives and managers, yet in the rush of mill work this duty is often neglected, with the most distressing results. The number of deaths and injuries caused by accidents in our industries has reached such proportions as to shock the public and call for the application of the most thoroughgoing means of prevention. A great service in this direction has been rendered by the Aetna Life Insurance Company, Hartford, Conn., in publishing a 174-page volume entitled "Safeguards." It is a book of suggestions for the prevention of accidents in mills and workshops, compiled by David Van Schaack from many sources, of course with the advantage afforded by the experience of the Accident and Liability Department of the company. It is well written. The illustrations are numerous and excellent. The contents are well classified. It should be placed within reach of every worker in every mill and workshop in the country. Mill owners and managers should not only buy the book for themselves and their operatives (the price is 50 cents), they should also cooperate with the publishers to make future editions complete, so as to cover causes of accidents and means of prevention that may be lacking in the first edition. The contents of the volume are as follows:

Prevention of Accidents, Ignorance, Careiessness, Unsuitable Clothing, Insufficient Lighting, Defects of Machinery and Structures, Insufficient Room, Uncleanly Conditions, Lack of Good Air, Absence of Safeguards, Many Kinds of Safeguards, Need of

Safeguards, An Instance in Point, Safeguards Practical, General Suggestions for Safeguarding, Cooperation of Employes, Reporting of Accidents, First Aid, Emergency Room, Aetna Inspections, Gears, Belts and Pulleys, Fly Wheels and Driving Belts, Set Screws, Sprocket Wheels and Chains, Rolls and Knives, Punch Presses, Grindstones and Emery Wheels, Stairways, Platforms and Runways, Wood-Working Machinery, Elevators, The Electrical Hazard, Contracting, Bake Shops, Miscellaneous, Rules and Regulations, Warning Notices, etc.

A Textile Institute.

About two years ago a number of English textile manufacturers decided to form a Textile Institute, which should render to the textile industry a service similar to that now rendered to their respective trades by the Iron and Steel Institute, the Institute of Mechanical Engineers and other organizations. The English textile trade was sounded and the response was so favorable that the work was continued and an organization perfected. The Institute is divided into nine sections, each devoted to a department of textile work: Chemical; Cotton; Education; Engineering; Hemp and Jute; Linen; Silk; Woolen; Worsted. Among the vice-presidents are Max Muspratt, M. P., Liverpool; C. W. Macara, Manchester; Sir Philip Magnus, M. P., London; Sir William Mather, Manchester; W. Henderson, Dundee; Sir William Crawford, Belfast; Sir Arthur Nicholson, Leek; Sir Mark Oldroyd, Dewsbury, and Sir William B. Priestley, M. P., Bradford.

The secretary of the Institute is George Moores, 12 Exchange St., Manchester, Eng. Mr. Moores is well known to many of our readers, as secretary of the British Weights and Measures Association, and as a member of the Lancashire delegation which visited the United States several years ago to investigate the growing of cotton.

The number of sheep in Australia and Tasmania during 1908 was 86,952,563, compared with 70,602,995 in 1900.

Is This the Largest Loom?

In a recent issue the Leipziger Monatschift fuer Textil-Industrie gives an account of a large loom for weaving seamless felts for paper-making machines. The loom, which was built by the Saechsische Maschinenfabrik, Chemnitz, for F. L. Wolff und Soehne, Rodewisch, is 75 feet 5 inches long, 14 feet 9 inches deep, 9 feet 10 inches high, and weighs 77,000 pounds. The reed space is 59 feet, and the loom is run at the rate of 15 picks per minute. During the past ten years we have noted the building of a number of very large looms, the largest being one with a reed space of 48 feet 9 inches, and constructed in 1903 by the German builders named above. It was claimed at the time that this was the largest loom in the world, but that distinction must now be yielded to the 1910 loom from the same works. If any of our readers know of a larger loom we should be pleased to have them send us the particulars for publication.

Dividends in German Cotton Mills.

The German public had been prepared by the reports of business depression in the German cotton industry for a decided reduction of dividends. For this reason the reports for 1909 from 52 German cotton corporations, having a capital of M94,774,000 ($22,738,560), recently published in the Frankfurter Zeitung, came as a surprise. For 1908 these 52 companies paid M10,067,000, while in 1909 the total dividend payments amounted to M9,290,000, showing but a small reduction for what has been heralded as a year of disaster. Commenting on this showing the Leipziger Monatschrift states that it must be admitted the dividends curve does not run parallel with the net profit curve.

That journal states that the 1909 dividend anomaly is explained by the large surplus funds held by many of the mills and from which payments are made to the stockholders which are not warranted by the net profits. Eight of the 52 companies paid higher dividends for 1909 than for 1908, and

the Monatschrift calls attention to the fact that two of these increased the dividend in the face of a decided decrease in the net profits, and offers as an explanation the fact that the stock of these two corporations was recently listed on the German Bourse. The object, of course, was to maintain public confidence in the stock by keeping the dividends at a high rate. There is an inevitable end to this course. The Monatschrift adds that the prospect for the coming year is dark. If raw cotton remains at the present high price the consumption of goods will be restricted. On the other hand, if the price of cotton falls the mills will lose heavily by reason of the shrinkage of values.

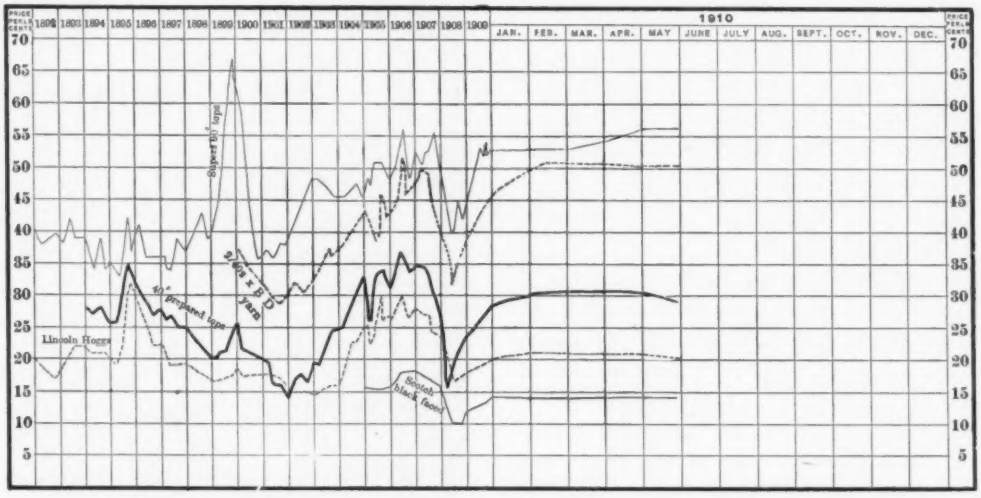


CHART SHOWING COURSE OF PRICES FOR WOOL, TOPS AND WORSTED YARN AT BRADFORD, ENGLAND.

THE BRADFORD MARKET.

(By Our Special Correspondent.)

Bradford, Eng., May 30, 1910.

The King's death, occurring at a time when 90 per cent. of summer goods are in retail possession, has had no weakening effect on the primary markets. Stocks of black dress and costume fabrics have been cleared completely. It happens, fortunately, that the winter worsteds on order are very largely of half-mourning character.

The London Wool Sales has left prices where they were in March. "American" (i. e., light shrinking) greasy crossbreds were neglected, but a weakness in coarse crossbreds was redeemed and merinos ended dearer than they began. There may be a slight slackening in the demand for fine worsted yarn, but none that matters. Eighteen to twenty weeks' delivery is asked for very fine counts by the best white botany spinners. Two-fold 24s and 32s can be obtained in two or three weeks. Spinners of crossbred manage to exact an extra fraction for very prompt delivery. Now that crossbred wool values are firm again, there will probably be some forced covering of commitments. Yarns are up on the month; colored botanys a penny up and crossbreds dearer by smaller amounts.

The English clip is coming upon the market and dealers who have been away in the rural districts have in some cases bought on the parity of last July. Certain growers hold out unreasonably, but a fair number of farmers are not disdaining a bid which improves on last May's price.

For reasons not easy to understand noils are out of the movement and relatively to wool and tops are abnormally cheap. Holders think that noils will have to go higher. Quotations for the leading descriptions follow:

60s Noils	14½-16
56s (Lister-Botany)	12
50s	9½-10
40s Crossbred	9 - 9¼
36s English	8½- 8¾
Scotch White Highlands	7½

Lister-combed long noils 2-2½d. advance.

THE GOVERNMENT COTTON STANDARDS.

BY CHARLES RICHARDS DODGE.

The system by which the certified grade samples of American cotton will be issued by the Department of Agriculture has been perfected, and as the classification is already in use, some later facts in relation to the work may be of interest,—for which I am indebted to Dr. Nathan A. Cobb of the Bureau of Plant Industry.

The New Orleans Exchange and the Farmers' Association have already formally adopted the new classification, the Memphis Exchange will probably follow at an early date, while the New York Exchange is considering the matter. I am told by Jules Mazerat, chairman of the New Orleans Exchange classification committee, that European cotton men visiting in this country are showing a decided interest in the standards, and if adopted by Liverpool and Manchester there is no reason why they will not be generally accepted as the world's standards.

The graded samples are arranged in nine stout, cloth covered cases, measuring about 20 by 20 inches, and 4 1/2 inches deep, one entire case being devoted to each grade, which comprises 12 samples in as many compartments. When a set of the grades is issued, in addition to the official label each box bears the seal of the Department of Agriculture and the signature of the Secretary of Agriculture, certifying to the grade on the date of issue. Before the set is sent out each box of cotton is photographed and a print is made the full size of the samples. This is fitted into the cover of the box, and as it reproduces every detail in the samples, such as bits of trash, or the depressions and irregularities in the surface of the cotton, any after disarrangement, or substitution, can be detected at a glance. It should be noted that the surface of the cotton shows the grade, and that the photograph represents the cotton on the date of certification.

Each box bears a handsome label design (measuring 7 by 9 1/2 inches) in gold and blue on white paper, setting forth that these are the official cotton grades of the Department of Agriculture, and are the U. S. Standards of American cotton. The special grade contained in the box is plainly designated in gothic lettering three-fourths of an inch high, in dark blue against the device of an eagle in flight, pale blue. In the notice which follows instructions are given regarding care of the samples, in handling, etc. When not in use the boxes are to be kept

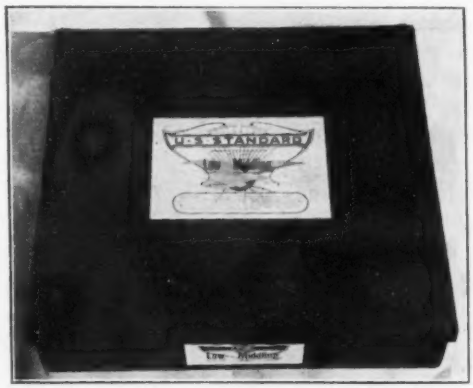
BOX OF GRADED SAMPLES. LOWER HALF SAMPLES, UPPER HALF PHOTOGRAPHS OF THE SAMPLES.

tightly closed, as exposure to light and to dust destroys the grade.

The importance of having sets of the official standards always available in Washington for purposes of comparison, or in case of dispute, is obvious. In time there are bound to be slight variations in the grade samples preserved at the different exchanges, from deterioration, carelessness or other causes. Slight difference will be

found also in the classifications made in different laboratories or classifying rooms where the grading is done, owing to the impossibility of having precisely the same conditions of light. Even the different construction of two skylights might make a very appreciable difference in the appearance of the cottons examined under them; anything like bars of shadow from cross supports making trouble.

It follows, then, that the Department must exercise the greatest care in the preserva-



SHOWING LABELS.

tion of type samples for future comparison, in order to avoid, as far as possible, any deterioration from atmospheric changes, the gathering of dust, etc. To this end the samples are preserved in glass vacuum tubes, which measure about three inches in diameter by 15 inches in length. In preparing these tube samples a surface layer one inch thick, of classified cotton of a specified grade, is carefully secured. This sample, which will measure 6 by 8 or 8 by 10 inches is laid face down upon a sheet of cleaned white paper; it is then carefully rolled around a core of waste cotton, and inserted into the tube with the paper next the glass. Asbestos wool, to a depth of several inches, is crowded into each end of the tube to prevent any scorching of the cotton sample by the flame when the tubes are sealed. These are placed in racks in an upright position. About 25 sets of graded samples in vacuum tubes will be preserved, in this manner, for future reference as may be required.

The work of grading is carried on in a new laboratory or classifying room, recently constructed at the top of a building near the Department, where the light conditions are the best that can be secured. Dr. Cobb has made a special study of the question of proper lighting, and the skylight has been placed some 20 feet above the examination tables in order that the light will be perfectly diffused. To insure immunity from sunlight the U. S. Naval Observatory authorities recommended a pitch or inclination of 72° (north exposure) though the light at such an angle is somewhat diminished on account of the intervening glass. An inclination of 53° was finally decided upon, which admits the maximum of light volume, the little sunlight that might enter at certain hours of the day being readily screened out when found necessary.

WORSTEDS IN ENGLAND.

WORSTED'S IMPETUS.

Some force invisible drives the worsted business impetuously on. Botany tops are sixpence over the price ordinarily regarded as the normal and the most favorable to one and all concerned. Crossbred tops cost twice as much as they did in the lowest ebb of their depression. Many forms of yarn are dearer relatively than the material from which they are made. Cloths are selling at all manner of advances up to a shilling a yard on the prices of last year, and still the business forges on, with barely a sign of flagging, and prices are firmer rather than weaker!

The condition is not one that can last forever; but for the time being it is impressive. Explanations of its existence are all a little hazy, but one cannot be far out in attributing the improvement to the wash of a wave of world prosperity—which, however, the cotton industry is still waiting to feel. Board of Trade returns are enough to show that the activity is in a large measure due to external conditions. Unhappily no returns show how near the outer world is approach-

ing satiation; but there is a general inference that stocks abroad cannot be so far depleted as they were twelve months back.

While other materials rise, noils linger. As every holder is able to prove, noils are quite unreasonably and impracticably cheap in relation to wool. Merchants say that noils will not withstand the general tendency much longer; but on this point their customers may have opinions. Possibly the great and constant production, the style of goods in vogue and the relation noils bear to waste rather than to wool, go to explain the backwardness of botany qualities. Doubtless there is a reason, whatsoever the difficulty of disentangling it may be.—The Textile Mercury.

REINFORCED CONCRETE IN TEXTILE MILL CONSTRUCTION.

By FRED S. HINDS, Mill Architect and Engineer.

Reinforced concrete for all kinds of manufacturing plants, either in mill form or in the modified mill form of construction has proved its practical value to manufacturers by its rapidly increasing growth. The great resistance of reinforced concrete to the vibration resulting from high speed or heavy machinery is due to the fact that it is formed into a monolith. The rapidity of constructing reinforced concrete gives it a large commercial value. The cost of reinforced concrete is practically on the same plane as other forms of mill construction, when the heavy loads it will hold are taken into consideration, as well as its adaptability to enlarge window area.

The safety of reinforced concrete structures can be assured by carefully prepared plans and careful supervision. Its strength and rigidity of construction on account of its monolithic form give great stiffness in its floor beams, whereas the quality of hard pine timber is constantly deteriorating, and does not give such stiff floors as formerly. All columns are bracketed or braced at junction with floor beams, also at walls, which is an unknown feature in mill construction, except its thick walls bracing the whole structure. The use of steel I beams in lieu of hard pine beams is only a makeshift to obtain more rigid floors. These I beams have warped and twisted in fires, where the hard pine plank has only been charred. If these steel I beams are fireproofed the construction would cost more than even concrete construction.

The light load of textile machinery is considerably less than provided for in other lines of manufacturing buildings. For the manufacture of light machinery 150 lbs. per square foot is the assumed live or applied load. The distributed live load of cotton machinery is from 35 lbs. per square foot in the picking and carding room to 25 lbs. in the spinning room. Double this for vibration and we have 70 and 50 lbs. respectively; but the common law of mechanical engineers is to add 50 per cent. of load for vibration. These loads are taken from a detailed table of weights of machinery, shafting stock in process and employes, in fact everything on the floors and ceilings and as compiled by the late Edward Atkinson.

Thus the live load in a cotton mill cannot exceed 70 lbs. per square foot for one floor, and 50 lbs. per square foot for the remaining floors, or both at highest maximum load. The supporting load of concrete floor slabs is directly proportionate to the live load, but the thinnest practical slab to construct, 3 inches thick, will easily support a live load of 100 lbs. per square foot. Some readers will answer that the large hard pine timbers will carry more than the above loads. Granted, but they are increased to these large sizes only to obtain stiffness. Here is just where concrete comes in, as the very nature of its structural materials is to insure the greatest stiffness. Under heavy load tests reinforced concrete shows very slight deflection in beams, and practically none in floor slabs, or so slight that all are very level floors. All computations are based on green or wet concrete, which in six months becomes from 30 to 50 per cent. stronger than when it obtains its first set. With these light live loads it is possible to construct concrete columns properly, reinforced at a

much smaller size than is usual in factories built of concrete as a monolith.

Another important reason is in the fact that the cost of fire insurance on the buildings can be considerably reduced, as the fire insurance companies are now appreciating the fireproof qualities of concrete for housing machinery and stock in process. This valuable contents must be protected even in fireproof mills by sprinklers and the regular fire protection system. The lower rate of insurance may not seem large enough to warrant erecting a concrete building, but everything must be saved in maintenance to apply to dividend earning power of the mill. This class of building erected adjacent to existing buildings reduces the cost of insurance for the whole plant and can readily be veneered with brick on the outside to conform to present buildings. The Boston Factory Mutual Fire Insurance Co.'s latest publication on Standard Mill Construction gives illustrations in support of reinforced concrete. First comes a large industrial plant built entirely of reinforced concrete, comprising several large buildings and a large one-story building with sawtooth skylights. Stairways are illustrated built in concrete.

Next comes an illustration of steel floor beams used as a substitute for hard pine beams supporting heavy floor plank. These had been through a fire, and the result was the I beams were twisted out of shape and the plank charred. These steel beams were not fireproofed. They could have been fireproofed, but then concrete slabs should be used in connection with them; this would be fireproof construction, but its cost would be greater than concrete. A machine shop was illustrated in steel construction which had been destroyed by fire and the whole structure was in a heap of twisted steel and fallen masonry. Plenty of examples are to hand to show that concrete constructed factories have passed through fires and come out practically intact. These three examples should appeal to the business judgment of the textile manufacturer and business man about to build a mill. Some will say that the concrete extension of a brick mill, or one in the same mill yard will not harmonize with the red brick. Then veneer the concrete walls with red brick. As anchors can be left in the concrete when green, when the concrete has set they become exceedingly strong anchors to hold the veneer of brickwork.

The question of waste and greater production of goods is the constant study of the manufacturer. The manager of every textile mill is ambitious to decrease the waste, both of stock and mechanical equipment, and to increase the production of goods. This can be accomplished both ways with a greater steadiness in the running of the machinery and power. This is possible, as can be readily perceived from the fact that with rigid and smooth level floors the machinery will run more steadily than if set upon plank floors and deflected wood beams. The writer when inspecting some English cotton mills, visited a saw tooth weave shed with looms standing on flag stone. Being struck with the high speed of the looms they were at once counted and found to be running 224 pick per minute. These were 36 and 40-inch looms. It is often asked how the Englishman makes such good yarn out of poorer cotton than in America? Is the question not partly answered when it is understood that all their mills are fireproof, some with concrete floors and granolithic Portland cement top, and some have smooth flag stone laid on brick arches? A small weave room in this country was moved from a mill constructed building with plank floors into a concrete building and the manager was able to increase the speed much more than was possible under the old conditions.

The rapidity of construction gives it a high financial value in completing the building earlier than any other type of construction. There is no delay contingent upon slow delivery of materials, such as hard pine timbers, which on large orders of 16-inch timbers, are in the tree when ordered. We learned of a plant recently where the roofs of a plant were delayed 30 days waiting for rafters. It is a common thing, after the foundations are completed, to run up a concrete story every ten working days, using the same concrete forms over and over as the structure rises on the foundations.

Work can be begun promptly; cement, sand, broken stone, form lumber and steel bars can be secured on short notice. The steel reinforcing bars are shipped straight, in most cases, and then bent to the desired shape at the building. It usually takes six months to build an average sized four-story mill and have it ready for the machinery. A mill in concrete can be built and made ready for machinery in five months. A factory in Brooklyn, N. Y., was built in just four months. This factory was similar to mill construction. The size was 75 by 600 feet, six stories high.

(To be continued.)

AN OLD SOUTHERN COTTON MILL.

The great development of the cotton manufacturing industry in the South since 1865, which has exerted an important influence on the trade in raw cotton and cotton goods, not only in this country but throughout the world, is apt to obscure the fact that long before the civil war there were enterprising and far seeing men in the South who had the courage to establish cotton mills in that section and the ability to run them successfully. Among these enterprises was the mill at Trion, Ga., which was established in 1845 by Judge A. P. Allgood in conjunction with Spencer March and William K. Briers.

The first mill was a frame building, 113 by 50 feet, and finished in 1847. It manufactured yarn in five-pound bunches, which was peddled from wagons throughout the neighboring country. The mill, which had four spinning frames, prospered from year to year and in 1857 Judge Allgood bought Mr. Briers' interest, making Allgood and March sole owners of the property.

In 1875 the output was 10,000 yards of cloth and 2 to 3 bales of yarn per day. In the spring of that year the mill was entirely destroyed by fire, with not enough insurance to cover the loss. Nevertheless a stock company was immediately formed and capitalized at $225,000. Messrs. Allgood and March owned all except $40,000 worth of the stock. In less than six months from the organization of the company the brick had been made, the timber got out of the woods, the machinery installed and the mill was in operation.

Judge Allgood remained president of the Trion Mfg. Co. until his death in 1882, at which time it was one of the most successful manufacturing establishments in Georgia.

THE TRION MANUFACTURING CO., TRION, GA.

Judge Allgood was succeeded by his son, De. F. Allgood, under whose management the mill has continued to prosper.

In 1889 the plant was enlarged so as to double its capacity and enable a finer quality of goods to be made. In the fifteen years from 1875 until the enlargement, the stockholders received $105 in dividends from every $100 worth of stock. On the death of

De. F. Allgood in 1890, Mr. A. S. Hamilton of Rome, Ga., who had married a daughter of Judge Allgood, was elected president, and has served faithfully in that capacity since that time.

The mill has continued to prosper and has today a surplus of $350,000, with a capital stock of $225,000. The present capacity is 40,000 yards a day; 85,000 bales of cotton are consumed per year. About 550 hands are employed, the payroll being $100,000 per year. The factory has run continuously through bad times as well as good, making an enviable record and one that is equaled by few mills either in the North or South.

SCENE NEAR TRION, GA.

The management has carried out a wise and liberal policy in their relations with the operatives. Dwellings are supplied free of rent to the family help. The company has built a fine school house where the children of the employes are educated.

Trion is a very attractive town, having three churches, the Methodist, Baptist and Christian, and there are few places where the people are more contented or the outlook for the future more promising than here.

The shipment of worsted from Huddersfield to the United States during February, 1910, amounted to $39,882, an increase of $17,287 over the same period in 1909. The shipments of wool amounted to $11,392, as compared with $134,330 in 1909.

THE WORLD'S WOOL CLIP.

By REGENT.

Sheep statistics are, and perhaps always will be, eyed with some suspicion. They are taken loosely in most countries, are the result of guesses in others and have to be collated from widely different sources at varying periods of time. There is no real check on them and sets of figures purporting to tell how many sheep there are in the world must be accepted with the reserve that is due to their mixed and obscure origin. It will illustrate the difference of opinions on the subject to point out that one of the publications of the year makes the total 544,382,049. Another gives 482,884,528 as the grand total. Flaws are evident in the compilation of both sets and although implicit reliance need not be put in either, note may be taken of the lower estimate of the two. Dalgety & Co., Ltd., the largest handlers of Australian wool, compare the figures at latest date with those of 1895. Their summary follows:

SHEEP.

	Latest date.	1895.
Europe and Russia in Asia (chiefly 1904-7)	177,330,608	198,194,214
Australasia (1908)	109,345,967	110,516,331
So. America (chiefly 1908)	91,187,013	102,847,134
No. America (chiefly 1907)	59,252,721	57,158,652
Africa (chiefly 1904)	27,764,492	31,890,052
Asia (chiefly 1904)	18,003,727	21,957,752
Total	482,884,528	522,564,135

Loss of Sheep, 39,679,609—approx. 7½ per cent.

In comment on these figures it can be said that the total cannot possibly be right, although the comparison may indicate the general trend of things more or less faithfully. Holland (with over 600,000 sheep), Turkey, Persia, Afghanistan, Tibet and China are all missing from the account and except by guesswork their flocks cannot be estimated. The table shows a decline in Europe of 21 million head inside a period of about 13 years. Sheep culture in the old or industrial countries palpably is declining; Germany, which had 25 million sheep in 1870, had 8 million in 1904. Everywhere the tendency is to move sheep back from dear land or corn land. The tendency is seen in new countries as well as in old, and the general message of the comparison is that so far as concerns number of head, expansion in the new countries does not counterbalance contraction in the old.

Number of sheep is not everything in considering the supply of wool. The general influence of improved breeding methods is to increase the yield per animal. Thus in Australasia a century ago the clip was about 3 pounds per sheep; last season's average was 6 pounds 14 ounces. Last season 1,000 fleeces made 20.92 bales and in 1896-7 only 16.75 bales.

On many stations the average fleece weighed ten pounds and in Australia, Argentina and even South Africa they are now breeding from merino sires that give 20 pounds of wool in shearing and from Lincolns which give 30 pounds. The very break-up of large estates in Australia, although it may do detriment to the get-up of wools, contributes to increase the weight per animal. The smaller grower, with one eye on the fat lamb market and the other on his rough grazing, decides on crossbreds, which have larger frames and return more and coarser wool than blood stock. Crossbreds form 90 per cent. of the 22 million sheep in New Zealand and South American wool once preponderantly merino is now preponderantly of mixed growth. With some figures to show the rise of sheep growing in Australasia and the appalling checks administered by the great droughts one may pass from sheep to wool production.

Sheep in Australasia (millions and decimals):

1860.....	20.30	1895.....	120.77
1870.....	49.68	1900.....	90.47
1875.....	61.89	1901.....	90.82
1880.....	65.49	1902.....	92.55
1881.....	75.16	1903.....	72.95
1884.....	84.04	1904.....	74.88
1885.....	76.12	1905.....	84.96
1886.....	82.72	1906.....	94.51
1890.....	101.93	1907.....	104.67
1891.....	114.68	1908.....	110.20
1892.....	124.98		

The National Association of Wool Manufacturers made for 1903 an estimate of the world's clip of wool, which can be thus summarized:

Europe	lbs.	938,000,000
North America	lbs.	304,500,000
South America	lbs.	510,000,000
Central America and W. I.	lbs.	5,000,000
Asia	lbs.	274,000,000
Australasia	lbs.	500,000,000
Africa	lbs.	134,450,000
Oceanica	lbs.	50,000
Grand total	lbs.	2,666,000,000

Except in an indefinite way this calculation cannot be regarded as a very valuable statistical exercise. At all events as regards Asia there must remain a doubt of the complete authenticity of the figures and for practical purposes a calculation of the wool that is shorn is a good deal less valuable than one giving the quantities that find their way to civilization and the centers of manufacture. The wool that tribesmen of the primitive races grow, industrially speaking, does not matter. It matters a good deal to know with reasonable certainty how much wool passes the ports and here we can get satisfactory assurances from the Customs.

The following shows the increase now in progress in shipments of wool from Australia and New Zealand, the principal source of import supplies:

Shipments from Australia and New Zealand in bales:

1902-3....	1,440,722	1906-7....	2,090,188
1903-4....	1,366,912	1907-8....	2,057,831

1904-5....1,595,734 1908-9....2,288,104
1905-6....1,869,455

Net pounds, 710,168,448, 686,818,010 and 756,590,163.

Increase in seven years, 847,382 bales (279,636,000 pounds).

The River Plate, the second great source of foreign wool, has no such increase in progress. Its wool exports are growing but the general character of the supply is stationary or worse. The exports are quoted from Wenz & Co.'s tables:

Shipments from River Plate in tons (2,000 pounds):

1897-8.....273,350 1903-4.....236,610
1898-9.....269,720 1904-5.....231,110
1899-00.....263,340 1905-6.....226,270
1900-1.....243,980 1906-7.....227,590
1901-2.....261,800 1907-8.....251,460
1902-3.....272,140 1908-9.....256,300

Increase in three years, 30,030 tons (60,060,000 pounds).

Reports show an improvement in River Plate shipments in the last wool year. Up to Sept. 16, 1909, a fortnight before the close of the season, 554,276 bales had been shipped as against 472,631 in the same part of the season previous. For the season 1908-9 shipments of Plate wool are hence over 513,000,000 pounds and this with the Australian supply gives approximately 1,270,000,000 pounds; half, or nearly half, of what is generally supposed to be the world's clip. No distinction is here drawn between clean wool and greasy, so that a liberal allowance for guesswork must be made in arriving at the yield after washing.

For estimates of the amount of clean wool that is available for the uses of manufacturers in North America and Europe the wool world is much indebted to Helmuth Schwarze & Co., wool brokers, London. Mr. Sauerbeck of that firm is a practical economist of the first order, whose statistical labors are universally esteemed. He deals in the statistics which follow with the amount of wool produced in North America and Europe (excluding the Balkan Peninsula) and with the wool imported into the same two continents, the United Kingdom included. Out of consideration of space the table relating to grease wool is omitted. Let it suffice to say that in estimating yields, shrinkages have been allowed for approximately as follows:

British wools 25%
Continental 33⅓%
North American 66⅔%
Plate and Australian 50%
Other wools, mohair, etc. 35%

To be exact, the allowance for shrinkage varies in each year, accordingly as the condition was heavy or light, but the proportions named are the average:

PRODUCTION AND CONSUMPTION OF CLEAN WOOL IN EUROPE AND NORTH AMERICA
(IN MILLIONS OF POUNDS)

	PRODUCTION.				IMPORTS.					
Year.	United Kingdom.	Europe.	North America.	Total Production	Australasia.	Cape.	River Platte.	Other Sorts.	Total Imports.	Grand Total.
1895	101	300	134	535	365	45	184	128	722	1257
1898	104	300	121	525	310	45	226	119	700	1225
1899	105	300	123	528	308	43	239	120	710	1238
1900	100	300	127	533	272	21	187	112	592	1125
1901	103	300	136	539	321	33	250	93	697	1236
1902	102	300	147	549	310	37	232	112	691	1240
1903	100	300	133	533	281	35	243	132	691	1224
1904	99	300	133	532	274	30	213	140	657	1189
1905	98	293	136	527	313	33	223	147	716	1243
1906	97	287	138	522	332	33	215	169	749	1271
1907	98	280	139	517	409	44	230	164	847	1364
1908	101	280	143	524	353	41	231	113	738	1262

During 1909 imports into the two continents will of course show a large increase, but as the table stands, Europe and America had in the one set of six years an average of 1,220,000,000 pounds of clean wool at their service and in the next six an annual average of 1,258,000,000 pounds. How does this work out per head of population in the countries of the two continents concerned? Helmuth Schwarze & Co. present these figures.

Clean wool at disposal, per capita:

1861-1870.....lbs.	2.26		
1871-1880.....lbs.	2.43	Increase	7½%
1881-1890.....lbs.	2.57	Increase	6
1891-1900.....lbs.	2.76	Increase	7½
1901-1908.....lbs.	2.62	Decrease	5

The same authorities give estimates year by year of the proportion of merino to crossbred in the Colonial and River Plate clips. These estimates may help to explain why with a rising population the quantity of wool per head of people is as well maintained. The calculation is that in 1895 the proportion of scoured crossbred wool was 31.7 per cent., it was 50.7 by 1900, 48.1 in 1902 and 51.8 in 1904. The proportion fell until 1907, when 45 per cent. was indicated; it rose to 46.7 per cent. in 1908. It is the conviction of those men who know the colonial markets best that crossbred will increase relatively to merino. It cannot be said that the prices obtainable for mutton for twelve or eighteen months past have done much to stimulate the breeding of mutton sheep, but the American tariff—putting as it does a premium on light-condition wool—continues unmistakably to encourage pastoralists to aim at the production of a fine crossbred quality of fleece.

GEORGIA INDUSTRIAL ASSOCIATION.

The tenth annual meeting of the Georgia Industrial Association, which is composed of all the textile mills in the State of Georgia, will be held at Brunswick, Ga., and Cumberland Island, on June 17th and 18th.

At the opening session the convention will be addressed by Mr. Lewis W. Parker, President of the American Manufacturers' Association. Mr. Parker has selected for his subject "The Necessity of Cooperation and the Advantages to be Gained."

There will be two sessions of the convention at Hotel Oglethorpe, Brunswick, Ga., on June 17th and one session at Cumberland Island on June 18th.

DRAFT AS APPLIED TO COTTON YARN PREPARATION MACHINERY.

BY BOLSTER.

(Continued from March.)

DRAW FRAME DRAFTS.

The subject of draft and drawing rolls on the draw frame is the most essential problem in connection with the machine. Although draw frames have been made with only three pair of drawing rolls, there are few if any being built at present with less than four pair.

In Fig. 8 a gearing plan of a Mason draw frame is shown, and the gears given are used on "common" rolls; i. e., steel bottom rolls and leather covered top rolls.

The total draft of the machine will be from the lifting rolls to the calender rolls, as follows:

$23 \times 22 \times 48 \times 90 \times 24 \times 3$ inch $\div$ $22 \times 22 \times$ D.C.G. $\times 22 \times 51 \times 1\frac{1}{8}$ inch $=$ 257.6 draft constant.

Then using a 40 draft gear, the draft would be $257.6 \div 40 = 6.44$ draft.

Special notice may be given at this point with reference to the "break draft" in the gearing shown in Fig. 8.

In the first place it will be seen that a change in the size of the draft gear will change the speed of the back drawing roll. As all the drawing rolls except the front are driven from the back, the second and third rolls will change with the speed of the back roll. The intermediate draft that will vary or break is between the front and second drawing rolls.

The following will represent the intermediate drafts with a draft gear of 40 teeth.

Between lifting and back drawing roll:

$23 \times 22 \times 1\frac{1}{8}$ inch $\div$ $22 \times 22 \times 1\frac{1}{8}$ inch $=$ 1.045 draft.

Between back and third drawing rolls:

$30 \times 1\frac{1}{8}$ inch $\div$ $21 \times 1\frac{1}{8}$ inch $=$ 1.428 draft.

Between third and second drawing rolls: 21 × 42 × 1⅛ inch ÷ 30 × 18 × 1⅛ inch = 1.633 draft.

Between second and front drawing rolls: 18 × 48 × 90 × 1⅜ inch ÷ 42 × 40 × 22 × 1⅛ inch = 2.57 draft.

Between front drawing roll and the calender rolls:

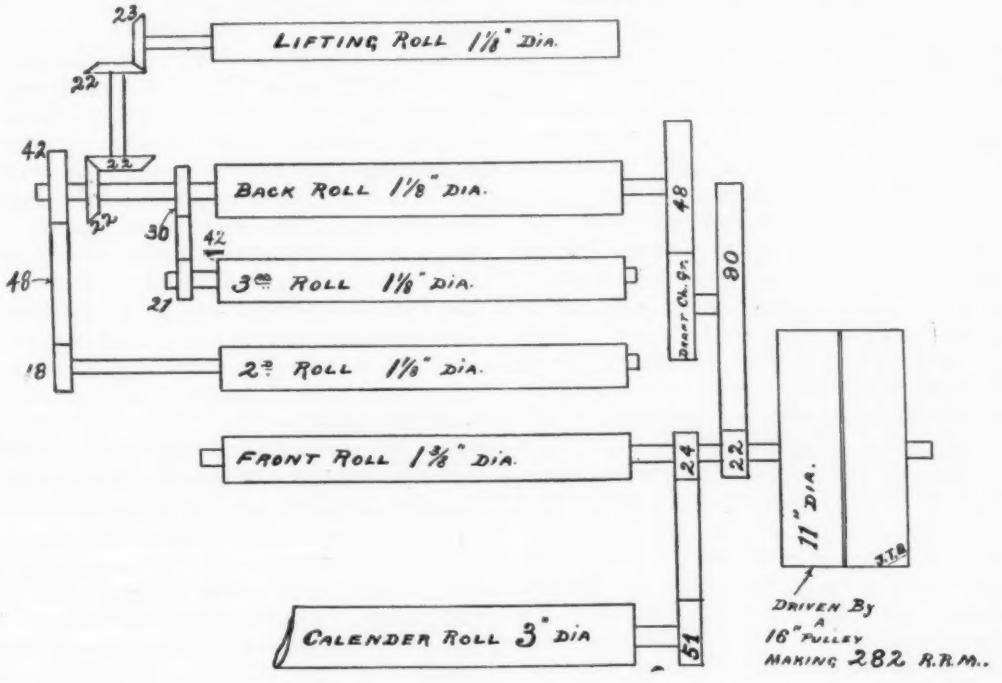


FIG. 8.

24 × 3 inch ÷ 51 × 1⅜ inch = 1.026 draft.

In comparing the foregoing intermediate drafts it will be observed that the draft between the lifter roll and drawing roll, and the draft between drawing rolls and calender rolls, are both tension drafts; while the principal attenuating draft is divided between the four drawing rolls as follows:

Front attenuating draft (between first and second rolls), 2.57.

Middle attenuating draft (between second and third rolls), 1.663.

Back attenuating draft (between third and fourth rolls), 1.428.

METALIC DRAWING ROLL.

In this style of roll, Fig. 9, the top as well as the bottom rolls are made of steel and have no leather covering. They are fluted somewhat similar to the common steel roll, but with larger flutes. The flutes of the bottom roll mesh into the flutes of the top roll, and drive the latter positively, which would not be the case if purely frictional contact was depended upon. The flutes are made usually in three sizes: 16, 24 and 32 pitch. They are allowed to mesh for about three-fourths of their depth. This, however, may vary a little with the rolls of different pitch. A roll of 16 pitch carries a collar about 7/1000 of an inch smaller than the boss of the roll. A 24 pitch roll carries a collar about 8/100 of an inch smaller, while a 32 pitch roll carries a collar 44/1000 of an inch smaller than the boss. From the above it will be seen that the amount of each flute in operation will equal 14/100 of an inch for a 16 pitch, 12/100 of

an inch for a 24 pitch, and 88/1000 of an inch for a 32 pitch. The diameter of metallic rolls will vary according to class of work being done and the machine on which they are used, but the pitch on a railway head or drawframe is usually as follows:

For the front roll 32 pitch.
For the second roll 32 or 24 pitch.
For the third roll 24 pitch.
For the fourth or back roll 16 pitch.

Owing to the crimping action of the flutes upon the fibers, the amount delivered from each roll per revolution is greater than would be delivered from a common roll of the same diameter.

With reference to the effect of metallic rolls upon the draft, the weight of the sliver delivered will indicate a different draft than that calculated through the gears. The exact difference will depend upon the weight of sliver treated, together with the amount of draft introduced.

For example, if a heavy sliver is being produced and a low draft is used, the difference will be less than when making a light sliver with a long draft. This variation is attributed to the fact that when a heavy mass of fibers are passing between the back rolls, they will not yield to the crimping action of the flutes to the same extent as the fibers passing through the front roll, because when passing the front roll their bulk has been considerably reduced and practically only a thin film of cotton is being delivered.

(To be continued.)

THE WORLD'S FLAX PRODUCTION.

BY CHARLES RICHARDS DODGE.

(Continued from April.)

This little kingdom has cultivated recently as high as 41,500 acres (in 1907), though last year the area under flax dropped to about 25,000 acres. Dutch methods of culture approach in thoroughness and attention paid to small details, the best systems of France and Belgium. Flax immersed at home is for the most part pool-retted, and is darker than the river-retted flax, some of it being of a silver gray. It is grown chiefly on lands rented from large landowners, and both the reed and the fiber is saved. The culture is gradually declining owing to the scarcity of labor, and to the low price of the product, as much of the fiber is scutched out or dressed by hand. Our imports of Netherlands flax vary from 100 to 600 tons per year, or a total, in five years, of 1,885 tons. The imports for 1908 were valued at about $285 per ton, which may be taken as an index of the grades we import. Mr. Hasselman informs me that the average for Dutch flax in the country where produced is about $300 per ton.

The Irish culture is confined almost wholly to the province of Ulster, the counties of heaviest production being Antrim, Down, Londonderry and Tyrone, averaging about ten thousand acres each; Armagh and Donegal over half that acreage, with three other counties having smaller producing areas. In the provinces of Munster, Leinster and Connaught a little flax is also grown. For many years there has been a steady decline in the Irish production, the area for 1908 being the smallest in ten years, showing a reduction from the previous year of over thirteen thousand acres and a falling off in fiber of 2,190 tons. This is attributed particularly to the fact that the price of scutched flax in 1907 was very unsatisfactory to the farmers, while the depression in the linen trade gave no promise of increase. Irish flax is pool-retted and therefore darker than Courtrai, showing a slight greenish tinge, or greenish gray. It is neither so glossy nor so fine, nor so well prepared, though the most of it is strong. While Irish flax has the reputation of being high grade fiber, the culture as practiced by the peasant farmers is slovenly and careless —wasteful and shiftless in the extreme—so much so that while the expense of cultivation is less than on the continent, the product shows a decline in the same degree.

The term "Irish flax" is, however, more or less a trademark, for Ireland imports the flax of many countries, in 1907 to the extent of 46,000 tons. Much of the Belgium, French and Dutch flax, retted in the Lys comes to Ireland, where it goes into manufactures that are regarded as derived from true Irish flax.

Irish mills consume imported flax to the extent of four times the home production, which was 11,000 tons in 1907, nearly 4,000

tons of which was exported. In our tables of imports "Irish" flax does not appear, though we import heavily from the "United Kingdom," these imports into the United States, in 1908, being 3,138 tons, worth $847,430, or an average of $270 per ton. It may be noted that the bulk of our flax imports are from Russia, Belgium and the United Kingdom.

Austria-Hungary produces several grades, the fiber of Bohemia and Moravia being of fine quality. Both dew and pool-retting are practiced, the former producing the darker, lower grade fiber. While the industry has been steadily declining in most European countries, it has fairly held its own in Austria during the past decade. The crop of 1907, however, showed a decline and that for 1908 a decided falling off from over two hundred thousand acres in 1897 to about one hundred and fifty thousand in 1907. There was a further decline last year of 30,000 acres. It may be remarked, however, that while the acreage has declined the yield of fibr per acre has increased. In 1897 the yield of fiber per acre was 445 pounds in 1906; in 1906, 715 pounds, and in 1907, 660 pounds. Very little fiber is exported to the United States. In 1905 there was a small import of 30 tons, valued at $300 per ton, which shows that it was flax of the better grade.

While the chief fiber crop of Italy is hemp —and the Italians grow the finest hemp in the world—considerable flax is produced, notwithstanding that the plants often suffer from drought. The flax of Italy, however, is greatly inferior to that grown in the more northern portions of Europe, and the yield per acre is much less. Lombardy produces the greater portion of the flax crop, though it is cultivated in other sections—and in the South largely for seed. Both dew and pool-retting are practiced. In Italy the crop is cultivated in two seasons of the year, the autumn flax giving the better yield. This may be stated at 4,400 pounds per acre, yielding 330 pounds of cleaned fiber. The figures for spring flax are: straw, 2,600 pounds, and fiber, 180 pounds per acre. The seed sowed represents 880 and 530 pounds per acre respectively. Trifling lots of Italian flax have been imported into the United States. It is of low grade and valued at only $133 to $175 per ton.

(To be continued.)

THE KNIT GOODS MANUFACTURERS' ASSOCIATION.

The annual meeting of the Knit Goods Manufacturers' Association was held at the Hotel Ten Eyck, Albany, on May 14. President Andrew Frey, of Utica, N. Y., called the meeting to order. In his report, Secretary W. H. Morton referred to the unsatisfactory business conditions prevailing at present, due largely to the high prices of raw material. He urged an increase in the active membership, pointing out the good results that would come from a united industry.

After the Secretary's report was read the old officers were reelected as follows:

President, Andrew Frey, of the Oneita Knitting Mills, Utica, N. Y.; first vice-president, John K. Stewart, J. K. Stewart & Sons, Amsterdam, N. Y.; second vice-president, George Clark, Brown Knitting Co., Warsaw, N. Y.; third vice-president, Frank B. Harder, High Rock Knitting Co., Philmont, N. Y.; fourth vice-president, John R. Blood, Blood Knitting Co., Amsterdam, N. Y.; fifth vice-president, Thomas Bailey, Bailey Knitting Mills, Fort Plain, N. Y.; treasurer, Beecher M. Crouse, Avalon Knitwear Co., Utica, N. Y.; secretary, W. H. Morton, Utica, N. Y. Three members of the executive committee whose terms expire May, 1912, were elected as follows: Quentin McAdam, Utica Knitting Co.; Nathan Hatch, Fuld & Hatch, Albany, and Eugene West, West Bros., Syracuse. The following are members of the executive committee whose terms have not expired: Expiring 1913, G. M. Traber, Perry (N. Y.) Knitting Co.; William D. Mahoney, Troy (N. Y.) Knitting Co.; H. S. McElwain, Diana Knitting Co., Johnstown, N. Y. Those of the executive committee whose terms expire in 1911 are: Judson Gilbert, Gilbert Knitting Co., Little Falls, N. Y.; W. T. Briggs, Johnstown (N. Y.) Knitting Co., and Robert McKinnon, of Robert McKinnon & Co., Little Falls, N. Y.

A separate meeting of the manufacturers of balbriggan goods was held for a discussion of the question relating more particularly to their branch of the knitting business.

The exports from Bradford to the United States in 1909 were valued at $20,458,675, compared with $11,348,158 in 1908. The principal increase was in the exports of wool, which amounted to $9,523,155, compared with $4,044,526 in 1908.

MEETING OF THE SOUTHERN TEXTILE ASSOCIATION.

This organization will hold its next meeting at Lakewood Park, Augusta, Ga., on Saturday, July 2. The meeting will be called to order at noon and at 1 P. M. will adjourn for a barbecue dinner, reassembling at 2.30 P. M. for the reading and discussion of papers. At 4 P. M. there will be a trolley ride. The evening session will be held at 8 P. M. at the rooms of the Chamber of Commerce. This will be followed by a smoker at which refreshments will be served and an entertainment provided.

Membership in the Southern Textile Association is available to superintendents, assistant superintendents, overseers, master mechanics, chief engineers, electricians, representatives of textile journals and instructors in textile schools.

The generous support extended to this association since its organization demonstrates that it fills a real want in the Southern trade, bringing together superintendents and overseers for mutual instruction in matters pertaining to their business, and what is equally important, contributing to better acquaintance and good fellowship among those engaged in the same trade.

THE BETTER BALING OF AUSTRALIAN WOOL.

The experience of wool growers during the past season is that, despite all that has been said as to buyers paying special attention to wool in good packs, the results of using the expensive packs are solely in favor of buyers, as wools so marketed realize no more than those sold in ordinary packs. When we come to think it out it is difficult to see how it could be otherwise; for the more expensive pack is not worth 1/4d. per pound to the buyer, and that is the minimum bid. While, of course, the larger holder can please himself as to the class of pack he uses, the smaller holder has to consider the £ s. d. aspect of it all.

It becomes plain, therefore, that if the bulk of the small men are to use expensive packs the buyers must agree to some concession. As matters are at present, the buyers have many concessions, not the least of which is the draft allowance, which they cling to so tenaciously. It has been said that it is the duty of the grower to market his wool in the best order; and while this is granted it can hardly be expected that he should be called upon to buy a better class of pack than that which has been in general use for years past, and was, until lately, quite satisfactory.—The Sydney Mail.

A WORSTED SPINNING AND WEAVING MILL.

From Uhlands Technische Rundschau.

The accompanying illustrations show the plans of a mill designed for Illies & Co., Hamburg, Germany, by the Saechsischen Maschinenfabrik, Chemnitz. The transportation of all materials in process of manufacture between the different rooms is carried on through the corridor, I. In room A, at the left, are two sets of drawing machines for warp and filling. In the adjacent spinning room, B, are 22 worsted mules having a total of 14,000 spindles, the room being 220 ft. long and 140 ft. wide. The weave room, C, has an area of 22,736 square feet and contains 266 looms, 40 inches wide.

Next to the weave room is the sizing room, D, in which are two slashers. In the room, E, are four warping machines. At the right of the corridor are the cloth store room, H, and the finishing room, G, also the yarn store room, F. The boiler house, K, contains three boilers, and is located next to the power house, D. Running nearly the whole length of the mill is the belt way. The main shaft in the engine room extends to the spinning room. From this shaft the various counter shafts are driven, as shown in the illustration. The main counter shafts are each provided with friction clutches so that they can be disconnected if necessary. The arrangement of the pulleys and shafting in the belt way and power house is shown at Figs. 7 and 10.

The growth of cotton in the United States in 1909 amounted to 10,363,009 running bales.

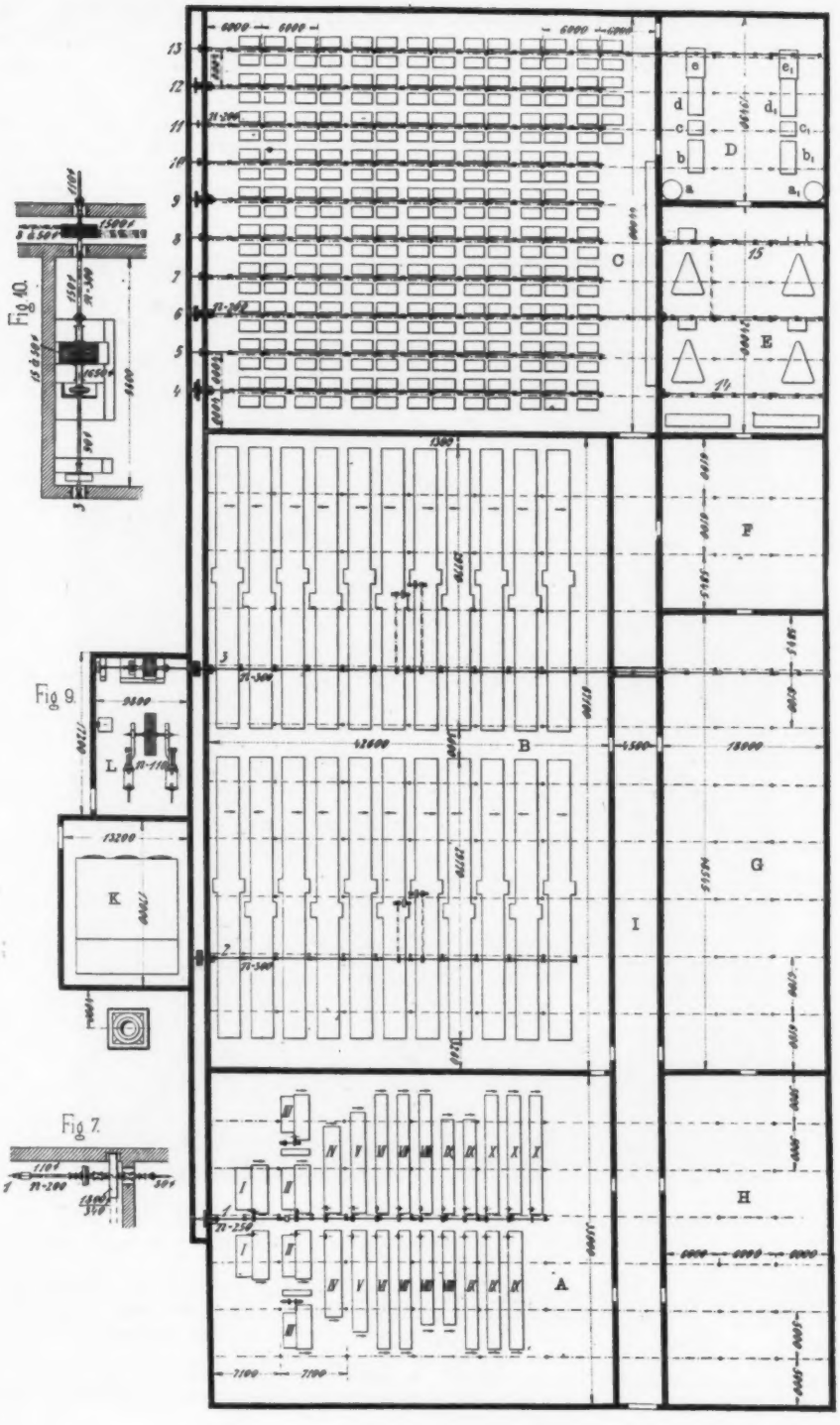


Fig 10.
Fig 9.
Fig 7.
A
B
C
D
E
F
G
H
I
K
L

The American Association of Woolen and Worsted Manufacturers.

The fourth semi-annual meeting of this association was held at the Waldorf-Astoria, New York, on May 19. The morning session was devoted to association matters, the attendance being confined to members. At this session President Frederick S. Clark in his opening address said in part:

FREDERICK S. CLARK, PRESIDENT OF THE AMERICAN ASSOCIATION OF WOOLEN AND WORSTED MANUFACTURERS.

We meet today under somewhat peculiar business conditions. Not only are woolen and worsted manufacturers experiencing a period of dull trade, but industries in general have had a serious setback. A glance at our business history of the last five years shows that the two or three years preceding October, 1907, the beginning of the panic, were years of unusual demand and consequent prosperity. Then came a year of business stagnation, which tried our souls and depleted our pocketbooks to an extent unparalleled in the experience of the present generation. The curtailment of production was enormous and the decline in prices was not limited to the cost of production. In other words, business was conducted at a loss.

This latter fact seems to have been entirely for-

gotten by those who have been clamoring against advanced prices in textiles. They compare panic prices with those of normal business, which is manifestly unfair. Panic conditions were perhaps the natural result of excessive expansion and over-production. Let us hope that the effect of the medicine will be lasting. I can see no good reason at this early date for a repetition of the dose. The depression was followed by substantial business recovery and the year 1909 brought a good demand and fairly profitable prices. I repeat, it is a peculiar business condition under which demand has again slackened and curtailment to some extent has been necessary.

It is not appropriate at this time to discuss the causes for this state of affairs. Cost of living investigations, false notions as to what affects prices, tariff agitation, politics, magazine articles by writers with none but the most superficial knowledge of their subjects—knowledge acquired we may almost say in a day—even of the most complicated industries all of these tend to retard business, but in my judgment the reasons which influence the halting attitude of buyers are not sufficiently valid to prevent an early return of business activity.

With the recent great curtailment of production it is impossible for me to believe that there is any material accumulation of stocks and with our farmers prosperous and labor employed at the highest wages ever known, the actual necessities of this great country are too pressing to permit another lengthy period of depression. I am, therefore, very sanguine for the future.

Since our annual meeting, business conditions have severely tested the strength of our association, but only to show its increasing influence and effectiveness. Much has been accomplished and many new members have been enrolled. In this connection, I wish to impress upon you the importance of increasing our influence by enlarging our membership. This can best be done by the personal efforts of members with their fellow manufacturers. I sometimes meet men who seem to pride themselves on being independent and on the fact that they belong to no trade organizations. Personally I have always felt that associations which were doing good work for my industry were of benefit to my individual business and justly entitled to my support. I earnestly hope this view may be generally accepted and bear good fruit in the six months to come.

Luncheon was served at noon after which an open meeting was held and the following papers read:

Cost Accounting.

By C. R. STEVENSON, 39 Wall Street, New York.

I have had since last fall the opportunity to study intimately the cost methods of five more worsted and woolen mills. In all cases the mills in question believed themselves the possessors of an adequate and accurate method of determining costs. In all cases I found that their boasted costs were nothing more than estimates, and inaccurate estimates at that.

As I pointed out at some length last fall, the crying necessity in making money in your business is to know what your goods cost and then to sell them at a higher figure. We will assume, however, that you do know what your goods cost, and that you are selling them in the open market for as much as you can get for them. The question of how to increase your profit is still a vital one.

The problem should now be attacked from the point of view of producing your goods at a lower cost. This is, of course, the problem which all manufacturers have to meet, and is in a way the great economic problem of the human race. Practically speaking, how can it best be met in your industry? Primarily through an increase in production with your present equipment.

I am, of course, assuming that in procuring decreased costs the quality and construction of the fabric is to remain unchanged. The two industries in this country where cost of production is lowest in comparison with the cost of the same article produced abroad, have long recognized as an axiom that the greatest possible production with a given equipment will produce the lowest cost. It is on this principle that the steel and watch industries of this country have been conducted. The reason for this goes back to the old question of the different elements of cost. Costs are, as I have previously pointed out to you, composed of three elements: labor, material and expense. Presupposing for a moment that we are working labor to the maximum efficiency, which is scarcely ever true, and that the material cost is at a minimum, there remains the expense element.

This factor of expense, as you all know, does not vary directly with the production of your plant. In the great majority of plants the production could be increased 50 to 100 per cent., with a little or no increase in the expense charges. In other words, up to a certain point, the margin at which the output is sold over the labor and material costs, barely serves to bring back to us the money which we have to pay out for expenses. Once past this point, and all of the goods which we sell, return as a profit the margin between labor and material cost, and the selling price.

It is the recognition of this basic principle which has led the steel corporation and the watch trust to sell their output abroad at lower figures than the same article is sold at in America. By doing so they have been enabled to operate their plants to full capacity, and have thus reduced the cost of their output, and secured a much greater profit on the goods which they sold in America, than they otherwise would have done. I do not mean to advocate here the "dumping" policy, or to suggest that you gentlemen should run your mill on fabrics which do not show a substantial margin of profit. I merely bring this point out to show clearly the great value of maximum production from the reduced cost point of view.

If now, we can, through the introduction of certain methods in your mills, bring about an increase of production with your present equipment at present expense, we will at once effect a notable reduction in the cost of your output.

There are two factors which determine the production of any wool or worsted mills—machine efficiency and labor efficiency. They are in many instances so closely interwoven as to be interde-

pendent. Theoretically, every machine which you have installed in your factory, from your scouring machinery to your folders, has a certain maximum production possibility, depending upon the speed at which it is running and the class of work upon which it is employed.

I am not attempting here to discuss the advisability of modern, up-to-date equipment. This is a matter which is self-evident to all of you. I am merely discussing how to best take advantage of the equipment which you have at your command. The first step is increasing production in your mill should be a careful determination of the speed at which your different machines are operating, and the carrying on of certain experiments looking toward a gradual increase. As a matter of fact, I venture to state that in most mills the speed of the same machines is not uniform. I met an excellent example of this sort in a narrow fabric mill in Michigan the other day. With the theoretical loom speed as set by the makers at 172 picks per minute, we found the actual speed of the looms varying from 145 to 128, with an average of 136. This at the start showed an average loss of 36 picks per minute, or about 18 per cent. of the possible efficiency.

mill are being done poorly in another and vice versa. Roughly speaking, however, I believe that a reduction of cost of at least 10 per cent. is possible in the preparatory department, and that an increase of 10 to 15 per cent. production can be procured in the weave room, and that 15 to 20 per cent. can be saved in the majority of finishing departments.

These savings in the aggregate go to make up an increase of from 10 to 15 per cent. in the net profit of the majority of mills. There are, of course, exceptions, but it is the average of which I am now speaking. With four or five exceptions the majority of woolen mills of this country are conducted in about the same way today as they were 15 or 20 years ago. Modern ideas of mill management, of control of the manufacturing situation, from definite statistics, of pushing for production, of seeking to reduce waste, and of endeavoring to increase labor efficiency, have not received favorable reception at the hands of your industry. Why this is so I cannot tell you. I can merely state, that looking at it from the outsider's point of view, and basing my conclusion on a careful study of a large number of fairly typical mills, I feel that the statement which I have made is a true one.

I do not believe that you gentlemen desire this state of affairs to continue. I believe you are ready for better things. I believe you want to make more money out of your property, and I believe that the possibility of doing so is staring you all in the face.

Millman and Finisher.

BY MR. JULES A. KERLE.

The first and most important point in finishing is the process of scouring. Good soap and thorough rinsing are requisite. Carelessness here courts failure. In fulling, watch the goods closely at the very start until the felting quality of the stock is known. With ordinary care little trouble arises in crabbing and steaming. Go very slow at the start on the napper or gig. Many goods are totally ruined in forcing the napping or gigging either by wire or teasels. Easy and gradual working up should be the rule.

When shearing, a man who loses his head is apt to lose his fingers, not speaking of what may become of the goods, therefore be careful. Rotary or hydraulic pressing needs care and judgment. The same weight and heat will bring out a stovepipe polish on one fabric and a raw appearance on another, all owing to the stock or weave. Singeing, dewing, calendering, brushing and many other processes, while of minor importance, still deserve their proper share of attention to help to attain the desired results.

Ultimate success, however, depends not alone on the finisher, the weaver or spinner, but on the correlative attitude between millman and finisher or dyer and finisher and each and everyone's help towards a common goal.

My pleas to millman and dyer or finisher conveyed in the most friendly spirit are:

First. Get together.

Second. Put implicit confidence in each other.

What do I mean by "Get together?" It is this: When launching into new lines of goods and after getting your bearings as to picks and ends, sizes of yarns and particular stock you believe to be just right, it would be wise to confer with the finisher as to what results are obtainable and what snags might be encountered in the various manipulations necessary to bring out the expected result.

This may sound trivial, but just now, when worsted weavers are trying to bring out woolen effects and woolen men are getting to take a hand in worsteds, it seems to be of vital importance, and much time and money may be saved by an exchange of opinion. There would surely be "less chaff and more wheat" during sampling periods.

It is not possible to lay down a hard and fast rule on finishing. Each tub has to stand on its own bottom and so each fabric, as to what processes are most suitable to bring out a desirable result, if it is in the wood.

A simple illustration: A serge weave 58 inches wide out of the reed will finish 55 inches as a plain serve, or 53 to 54 inches as an unfinished worsted, or only 50 inches as a blind-cheviot with the corresponding shrinkages in length.

So far all right, but what about the various stocks running the entire gamut from Bridge to Botany? You certainly cannot expect the same result and this is the strongest argument I can bring to bear on the close relations desirable between millman and finisher. "Two heads are better than one."

Many of you experienced trouble in goods cockling, caused either by an uneven balancing of the weave or a mixing of dyed grey or bleached yarns, particularly in check effects, without steaming the grey or bleached yarns in order to get it in the same condition as the dyed yarn; or the using of soft and hard stock yarn in warp stripes or in filling effects which even that panacea for most evils—the decatizing process—did not correct.

Has anybody here————no, not that tune. Has

anyone here forgotten that gentle breeze, starting west of the Alleghanies, gathering volume as it sped along, becoming a cyclone, engulfing almost every worsted textile man in its sweep and leaving so much wreckage in its path,—the Resist-Color-Wave or Craze?

That potent reminder ought to be sufficient evidence of the need for the millman and dyer and finisher to get together and prevent a recurrence of such costly experiences. Have confidence in each other—in other words—do not conceal things from each other. When a fabric contains 5 or 50 per cent. cotton, say so, then the dyer or finisher will know at the start what will be the most advisable thing to do in order to do justice to the fabric. When goods are fulled on after they are wool dyed he will find it out very quickly, but too late. What is the result? He has to cobble it up; extra handling, dubious results and often a rank failure. Who is to blame? Not the dyer or finisher. He cannot dissect every sample or fabric sent him, as the millman wants it back almost before he gets it off the loom. He has no motive to make a mess of it—to the contrary he is very deeply interested in its success, it being the forerunner of future business, if right.

It is thrown at the buyer at every turn. He gets the nausea, cancels what he rightfully or wrongfully can, and the end is a demoralized market, job lots for sale and the usual howl and severe losses. Here dyer and finisher also suffers along with the millman. A certain set of machinery crowded to the utmost, various other sets of machinery idle, a lopsided distribution of work, feast here, famine there, these are the first spasms. Slow deliveries, F & F famous the old cry, everyone feeling that he is neglected to the advantage of his competitors and a kicking all around—second spasm. Then the last and most aggravating spasm, goods returned, with that inevitable rubber stamp "S. S. to C." on the back of the ticket, the dyer's bugaboo and which haunts him in his dreams. He also feels sure that the pieces are stamped before goods are examined for fear it might be overlooked. Right here credit must be given to your Association for the great efforts made to eradicate this cancerous evil.

Modern Methods of Sponging.

BY M. D. BARNES.

It has never been suggested to me that I "go hire a hall," but it is needless to state that fact, for you will soon discover that I am a man of few words. It has often occurred to me that it would be well to have a pair of opera glasses convenient when the adjusters come round, but they are perverse fellows, all of them, and I'm sure they would insist upon reversing the lenses.

Although invited here to read a paper on "Modern Methods of Sponging," I believe your interests and that of the trade would best be served if the subject were, "Modern Methods of Manufacturing." Years ago you manufacturers gave the matter of sponging no thought whatever, because complaints of cockling, mill creases, undue shrinkage in width, discolorations, etc., seldom, if ever, reached your ears.

Steam never distorted a properly constructed woolen fabric, but since some of you have been trying to make silk purses out of sows' ears, people in my line have been between the devil and the deep sea. To meet a price you have made combinations of stock that will not stand sponging by steam nor water, to say nothing of the elements. Women's skirts that resemble the surface of a wind beaten lake and men's clothes with hunch-backed stripes are common sights on our streets. No suit and cloak manufacturer and no clothier would send out garments in such condition, nor would a retailer accept them, much less the individual, and so it must be plain to you that it is not due to any method of sponging in every instance! Almospheric moisture does the trick oftentimes.

We cannot know whether goods will cockle or not until the deed is done, but we do know that if the buyer lays his troubles, whether of cockling, discolorations or undue shrinkage before the seller, he is usually told that it is the fault of the sponger, and the informant immediately hugs himself in the belief that all responsibility has been shifted to other shoulders.

Years ago, when visiting woolen mills, I saw girls pulling cloths over forms and with pen and ink covering up vegetable fibers, but today I'm told that chalk in all the requisite shades is used in many mills for doctoring blemishes; these escape the examiner's eyes, the goods are accepted in good faith, sponged, chemical action takes place, garments are cut and completed and the sponger is asked to call and explain. He steamed the cloth, and somebody in turn roasts his pocketbook.

Woolens must be sponged before cutting, and the modus operandi is the same today as it was 20 years ago. We know of no other method and can conceive of none for low and medium grades of cloth; but I say again that steam sponging does not distort properly made woolens. It makes the fiber harsh, but that is overcome by refinishing. True, some goods are water, or so-called London, shrunk, the only true shrinkage and the only method that adds intrinsic value to a fabric, but that treatment would be heroic for the lower grades—the grades that mostly cockle.

Gentlemen, I believe cockling can be largely eliminated by a little painstaking on your part. Wool yarns shrink to one extent, worsted another, and cotton another, slack twist to one extent, hard another. In men's wear cockling oftenest occurs in plaids and stripes. The yarns forming these are of different construction than those in the body of the goods, generally larger yarns, and perhaps slack twist, or a combination of cotton and wool or worsted; these shrink unduly, and we have the ruffled face. A cotton thread makes more havoc than wool or worsted. It may surprise you to be told that the warp of haircloth will shrink 10 per cent. by water shrinkage.

And now a little suggestion: When about to put a new fabric on the market, have a few yards sponged, and don't go ahead until you know you are right. Some manufacturers do this, and have been saved much annoyance and expense. I take it that you do not care to be told of the process in sponging, but rather the result of it. If any here profit by what I have said, I shall not have spoken in vain.

Decatizing Wool Goods.

By R. M. MACINTOSH, of L. H. A. Schwartz & Co., Boston.

The problem of delivering worsteds and woolens from the mill ready for the needle has received much attention in the past few years; brought about, no doubt, by the introduction of a German apparatus called a "decatizing machine," for which claims were made that sounded mythical.

It was well known by American manufacturers that foreign mills were producing spot proof, permanent finishes, but the process had been considered a secret until it was claimed that decatizing was the real foundation of it, and that the mills well known for these finishes used this process.

About the time of its introduction in America, most manufacturers, especially of worsteds, were having considerable trouble with cockled cloth and probably the fact that dry decatizing overcame this caused more mills to take up with it than would otherwise have been the case.

Naturally, as with any new system, difficulties were encountered at first, but I think I may safely say that these have been almost entirely overcome and that today it is realized by many that this process improves practically any woolen or worsted fabric to a large degree.

The name "Decatizing" has been applied to two distinct types of apparatus, one for boiling and the other for dry steaming. The first is termed Wet Decatizing. I will outline this process briefly in a general way. Different materials and results required regulate the length of time for steaming and boiling, also the temperature of the water at different stages, so it would be useless to give any figures of time of these operations.

The process is generally done in the grey and is a combination of crabbing and boiling for luster. It is well known that, while goods are supposed to be thoroughly cleansed by the washing machines, the crab removes further impurities, but even after these processes pieces often will dye streaky from side to center, traceable almost invariably to the fact that they are not thoroughly clean. Here wet decatizing is especially valuable, for it will remove soap or other foreign matter from a piece presumably thoroughly cleansed and the evenness of color on piece dyes is made a certainty by it. For lustering it not only produces a better permanent luster than former methods, but also gives much more production.

The wet decatizing machine consists of a boiler with pumps, over which is a frame containing a winding attachment on one side of the boiler, a traveling crane above for carrying the cloth-roll, and an unwinding arrangement on the other side. The top of the boiler is either entirely open for admitting and removing the cloth roll, or else is fitted with a lid which slides open. Several cuts of cloth, the number being dependent on the weight of goods, are wound onto a perforated copper roller which is then placed in the boiler and connected with the pipe system. Running lengthwise in the boiler is an iron roller which presses against the cloth-roll, for its full length, pressure being secured by adjustable weighted levers operating on each end through stuffing boxes.

The roller revolves during the process, which starts by driving steam through the pieces for a few minutes. Cold water is now pumped in through the cloth and brought to a boil with steam. After boiling, the steam is shut off, and the water in the boiler sucked through the cloth. Fresh cold water following this cools the pieces, completing the operation.

The apparatus was no doubt founded on the old method of boiling for luster in a vat, by winding the piece on a roller, standing it on end in the vat and boiling, then reversing the position of the roll and boiling again to secure evenness of luster, or by laying the roller flat in the vat, boiling; then rewinding, end for end, and boiling once more.

The fact that the wet decatizing process works the steam and water from both ends of the roller and the water from inside the piece to outside, or vice versa, insures all that either of these systems gave and perfect uniformity of luster.

DRY DECATIZING.

The numerous functions that this process will perform, and the improved finish and handle imparted to any woolen or worsted fabric by it, have made it one of the most important additions to a finishing room devised for many years. The possibilities of the operation are so varied by the tension of winding upon the perforated roller, amount of vacuum, steam pressure, length of steaming, cooling, etc., that anything but a general description would be impossible. However, the impression that the process is too intricate for the average mill, is unfounded, as a little careful experimenting by the mills on their own materials will soon show them which method of operation is most beneficial.

Dry decatizing is usually done in the finished state, after shearing. Some mills decatize before pressing, others after. For any face finished material, or piece dye goods, dry decatizing in the grey is very beneficial and is practiced by some mills that do not have wet decatizing machines. It will put on luster, if desired, and will also make the cloth take the dye perfectly. There are three operations to this process, winding, steaming and cooling, each very important and worked differently according to results wanted. The winder rolls the piece face to face with a napped cotton leader-cloth, onto the perforated copper roller, which is then inserted in the decatizing boiler. This boiler is double jacketed, with air and steam tight door, which is closed after the roll is put in.

Steam may now be let into the outer shell of the boiler and the air in the inner compartment withdrawn by the vacuum pump. While this pumping takes place the cloth is being warmed by the steam-heated shell, thus no condensation takes place when steam strikes it. When a sufficient vacuum is secured the valve between the outer shell and boiler is opened, letting in the steam, and when steam appears at the try-valve outside the boiler, all outlet valves are closed, the pump stopped and pressure brought up in the boiler to the desired degree and held there for one to five minutes as desired.

Steam is now shut off and may be let away from the boiler by opening the valve outside, but if delicate colors are being treated it is sometimes

advisable to pump away the remaining steam in the roll before opening the boiler door. The door may now be opened and the roll is ready for cooling. For this purpose the roller is put upon a frame, holding, say, four rollers connected at one end to a pipe-system leading to a pump which cools the cloth to the desired degree. When high luster is wanted it is advisable to cool the cloth thoroughly; less luster is obtained by cooling for a shorter period. For mills where a large production is not required the roll need not be removed from the boiler and the vacuum pump may be used for cooling, but this is only practicable in small mills.

To describe the possibilities of decatizing on various materials would be a long task. In general the results are: Permanent, spot-proof, luster and finish; more even color on piece-dyed fabrics; curing or preventing cockles; setting of the fibers in place of shrinking; and much improved handle. The cost of operation is very small considering the added value in finish, handle and general appearance of the fabric. For maximum production two winding machines may be used. Here five operatives would be employed, producing from 80 to 100 pieces in 10 hours, the yardage necessarily depending on the length of the cuts. The cost per yard in such a case would be between 1 1/4 and 1 1/2 cents, which is so small compared with the improvement in the cloth that it is quite safe to state that the time is not far distant when all woolens and worsteds will be put through this process.

Naturally face-finished goods have been the first to feel this demand for permanent finish, principally broadcloths, of which German and Belgian makes with this finish have been imported for some years, and, notwithstanding the heavy duty, have found a ready market.

Other woolen and worsted materials are bound to follow, even though not as rapidly, for finish and design sell the goods and give competitive advantages more than high quality of raw material.

PRESSING.

The claim that decatizing will set the fibers of a cloth so that further shrinking cannot take place is made in good faith, but must be supplemented by one qualification, namely: that the goods have not been unduly stretched before the operation. True, many weaves may be rendered shrink-proof by decatizing, but a general statement, for all materials, would be too broad.

The era of "needle finish" goods is only dawning in America. In Europe, where decatizing has been in vogue for a longer time, it has been given much study, and to secure this it has been found necessary to overcome some of the stretch given by previous operations. Pressing as conducted by most mills, on the rotary system, was found to cause most of this trouble and therefore much experimenting has been done toward devising something to take the place of existing systems.

Paper pressing is acknowledged by all to be perfection, but the attendant expense, owing to small production, high labor cost, space occupied, etc., made it prohibitive for many, and thus an ideal has been pursued of securing its results without the sacrifice of the advantages of the rotary. Rotary systems in most general favor were on the double bed principle, and in analyzing their faults some very glaring ones have been discovered. (1) Overheating the goods, by which handle and condition were affected. (2) Excessive stretch. (3) Application of the pressure over too narrow a surface (some constructions having but one narrow strip on each bed in actual contact with the roller, some two). (4) Uncertainty of adjustment and attending results. (5) Too much luster on the back of the cloth. (6) Excessive "stove polish" sheen on the face.

One of the most important discoveries made by experimenting was that the double bed was unnecessary, for why hold and bake the cloth close to the roller for the width of these two beds when only a comparatively small surface of each bed is actually pressing? Thus the single bed was decided upon.

The excessive stretch was partly traced to the small diameter of pressing rollers formerly used, causing too much curve to the bed and consequently excessive pull on the cloth. It will be seen that if the pressure could be applied by running the cloth along a flat surface such a strain would not take place. Thus a roller of larger diameter and with consequent flatter bed was necessary and the leading foreign builders now construct pressing rollers varying in diameter from twenty to thirty-five inches against about fifteen inches formerly used. My reference to a flat bed is only by way of illustration, it being entirely impracticable, as here the pressure would be applied on a smaller surface than former methods employed. Applying the pressure over a small surface gives excessive stretch and "stove polish" sheen, thus a curved bed with a wide contact is best adapted. Securing even pressing with a narrow contact between bed and roller, as against a wide contract surface, is a very different proposition and to accomplish the latter it has been found necessary to bolt the bed firmly in position onto a permanently fixed bridge below, and let the roller aid in the pressing, by its own weight. In this method a lever system is used for applying pressure on the roller, downwards onto the bed, and it has been found that the adjustment of such a bed remains unchanged indefinitely.

With these various changes and the use of a highly polished German silver jacket in place of the brass ones formerly employed, causing less friction and polish on the back of the goods, a rotary that gives practically paper press results has been devised, resulting in a great aid in securing shrink-proof fabrics.

There is no doubt but that further improvements will be made toward this end, but the systems which I have outlined cover the requirements of today and give a cloth as impervious to shrinkage as if London shrunk.

The exports of wool from Australia to the United States for the six months ending December, 1909, amounted to 1,123,127 bales.

THE NATIONAL ASSOCIATION OF WOOLEN AND WORSTED OVERSEERS.

The twenty-seventh semi-annual meeting of the National Association of Woolen and Worsted Overseers was held Saturday, May 21, at Field's Point, Providence, R. I., and considering the weather a very large number attended the meeting. Between 300 and 350 plates were set for dinner and each chair was occupied. The meeting was called to order about 11 o'clock by President F. P. Gallagher. Chas. M. Hirst, one of the committee on arrangements, announced that the meeting was held at Field's Point instead of Boyden Heights because the latter had been sold and no arrangements could be made for the meeting there.

The minutes of the last annual meeting were read by Secretary Pickford and approved. Next in order was the voting for new members. New applicants for membership were turned over to the investigating committee to be reported on at the fall meeting.

The president announced that nominations for officers to be elected at the fall meeting were in order. It was suggested that they would retain the present board. For president, F. P. Gallagher; first vice-president, Louis Allison and James Pickford; second vice-president, Jos. P. Dolan, and third vice-president, Richard J. Hill; treasurer, Thomas Buchan; secretary, Walter Pickford and E. Fred Deverall. For trustees, Chas. M. Hurst, Louis Cormack and James Wilson.

President Gallagher read a letter received from Mrs. Marion Hey expressing appreciation for the kind attention and aid received from the members of the Association during the illness and after the death of her husband, the late Abraham Hey. Letters were also read from Louis Allison and Wm. E. Davison, stating their regret at not being able to attend the meeting. A letter of invitation from Secretary Knox, of the Dyers' Club, Providence, R. I., was read expressing the wish of its members to have the pleasure of entertaining the members of the National Association of Woolen and Worsted Overseers at their club room after the meeting.

The report of the committee appointed to consider the plan for the separation of the beneficiary department from the National Association was read by the secretary. This committee met at the Warren Hotel, Worcester, Mass., May 26 and reported as follows:

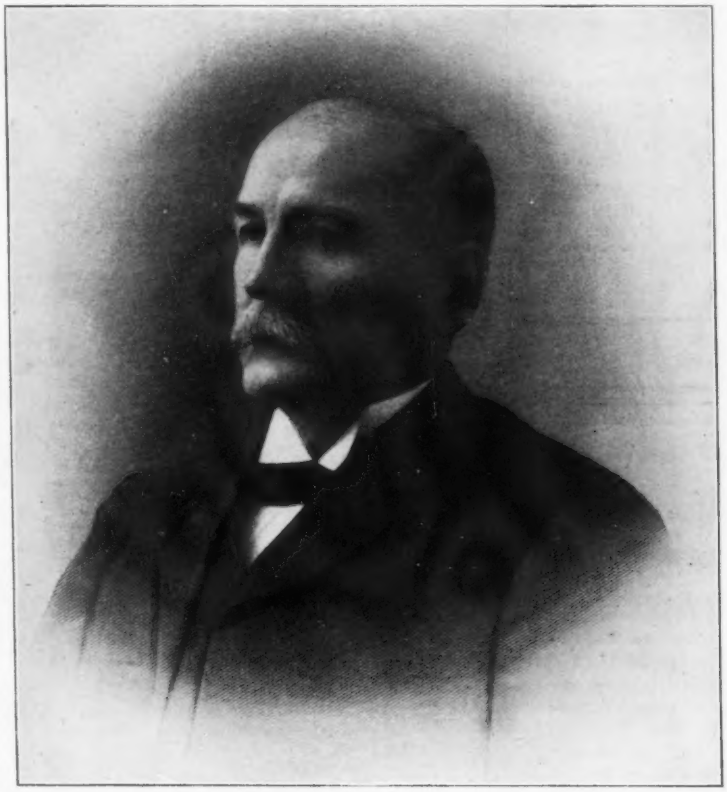
"Meeting called to order at 3.10 P. M., Warren Hotel, Worcester, Mass. W. E. Davison, Chairman. After reading the communication received from President Gallagher, also call for said meeting, it was moved and seconded that Walter Pickford act as secretary of this committee, and chairman Mr. Davison stated he was in total darkness regarding the separation and what had been done previously and asked for an expression of views from the members present. Remarks were made by Messrs. Durham, Moorey, Gallagher, Chamberlin and others. A motion was presented by Mr. Gallagher providing that the president of the Association should also be president of the beneficiary department and that the office of secretary and treasurer of the beneficiary department be merged into one office, the salary and expenses of this office to be paid from the funds of the beneficiary department. Secretary Pickford spoke in regard to the subject of a labor bureau in connection with the Association, which brought forth strong comments from T. F. Brennan as to the way in which certain labor bureaus in Boston were being conducted, Mr. Brennan claiming that certain employment bureaus were a detriment to the overseers. The question of establishing an employment bureau connected with the Association will be taken up at the next meeting."

A committee of five was appointed to arrange for the annual meeting and banquet this fall. The session closed at 4 o'clock.

The imports of wool into Belgium during 1907 amounted to 67,247 tons, valued at $42,778,974. France contributed 17,024 tons valued at $10,980,428. Austria contributed 14,383 tons, valued at $69,900. Great Britain contributed 14,002 tons, valued at $8,928,700.

The American Cotton Manufacturers' Association.

The fourteenth annual meeting of this organization was held on May 17 and 18 at Charlotte, N. C., the place of its birth. The number in attendance was especially large, this being due to the location at the center of the most important cotton manufacturing section of the South. The hotels of Charlotte were unable to accommodate the crowd, and the only inconvenience connected with the meeting resulted from this fact.



D. Y. COOPER, ELECTED PRESIDENT OF THE AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

The first session was held on Tuesday forenoon. After the call to order by President Lewis W. Parker and prayer by the Rev. Harris Mallinckrodt, the Mayor of Charlotte, Hon. T. W. Hawkins, delivered an address of welcome, the response being made by Thomas H. Rennie of Pell City, Ala. Mr. Rennie gave an interesting sketch of the history of the association and of its predecessor, the Southern Cotton Spinners' Association, which was organized in 1897 and merged into the American Cotton Manufacturers' Association in 1903, having grown from a local to a broad gauge national association during that time.

Next came the annual address of President Parker, who devoted special attention to a discussion of the methods of the New York Cotton Exchange. While avoiding the error of those extremists who advocate the abolition of all trading on exchanges, President Parker condemned in unmistakable terms the methods by which trading in cotton is conducted at present at New York.

He advocated not destruction but thoroughgoing reform, which would give the trade the facilities needed for legitimate business and put the gamblers out of business. His address was as follows:

Annual Address of President Lewis W. Parker.

Another year has passed and we are fortunate enough today to assemble in that city in which our Association had its birth. It must be most gratifying to those few who were then present to see its growth and development. The influence of the Association, and its beneficial results, will be magnified many times, however, when there is a realization that its officers have behind them the united support of the members.

The social features of the Association are important. Members are brought together and learn to know and to appreciate each other's good qualities. There is given relaxation from hard work and relief from business troubles, and the benefits of social acquaintance cannot be ignored; but the Association is truly organized for business purposes; to advance the interests of cotton manufacturing, and of those associated with it, to study the problems confronting us and to seek solutions. To this end your officers have labored, and should continue to do.

The past year in our business has been a period of great difficulties, and to most of us not attended with profit. While, in some few classes of goods, results, owing to special causes, have been satisfactory, this is not true in the great majority of cases, and in the case of some goods the operations of the plants have been attended with serious losses and reverses.

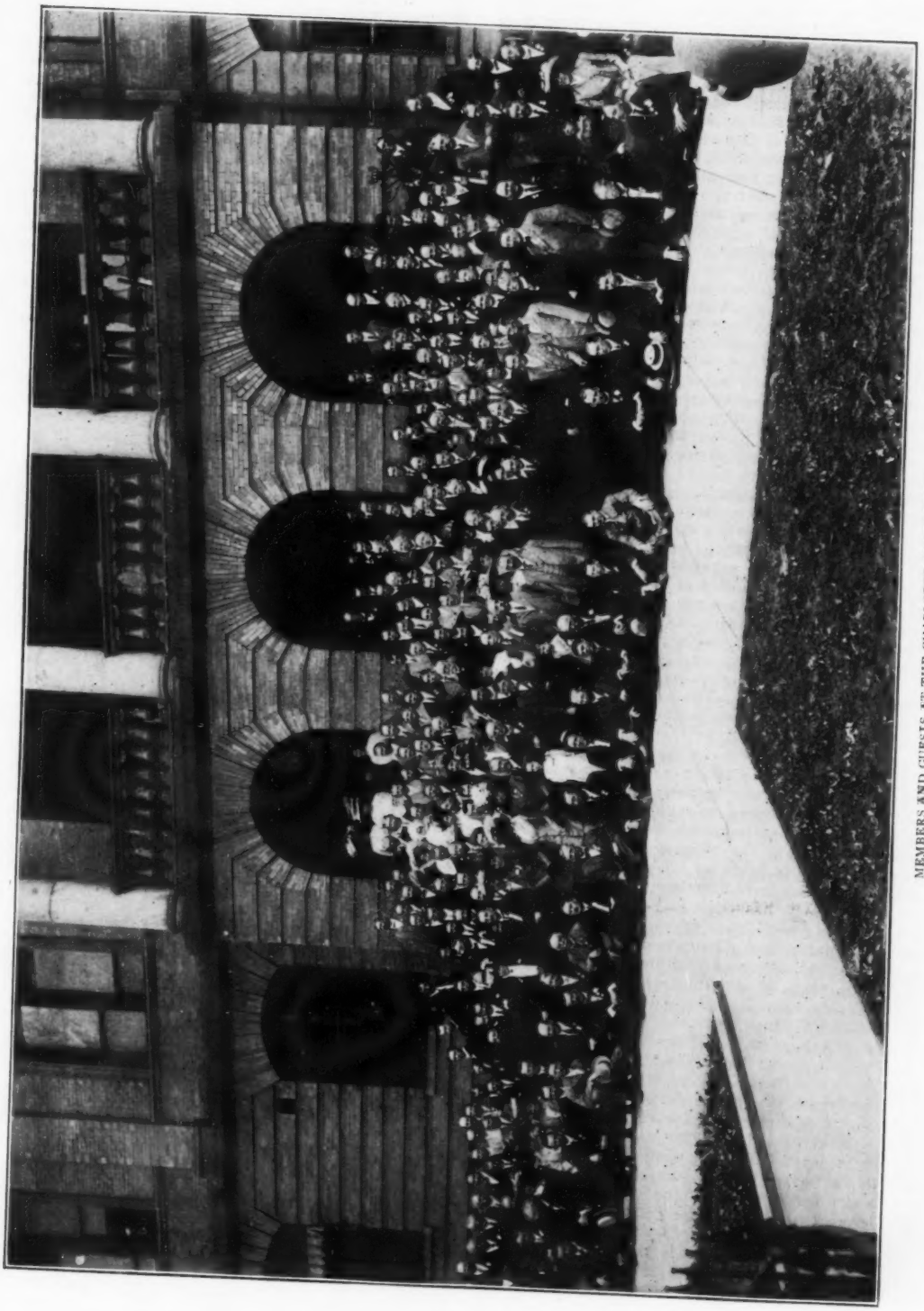
It seems a little difficult to see why such should have been the case. The country at large has, on the whole prospered; agricultural communities are, on the average, in better financial condition than they have been in many years; almost, with the single exception of cotton, crops have been large and prices satisfactory, giving to our agricultural friends good financial results; even in the case of cotton, while the crop has been regrettably small, the price resulting from the small crop has gone a very long way to make good the deficiency in production. In certain sections, at least, to-wit, the Atlantic states, where there was on the whole an average crop, in consequence of these high prices the communities are probably in better financial condition than they ever were before. Throughout the whole country labor has been generally employed at good wages, and in many branches of industry wages have been materially advanced.

It would seem, therefore, that the consumptive power of the people should have been greater than usual, and that there should have been a correspondingly large consumption of cotton goods. During the year 1909 the cotton mills of the United States, as a general proposition, ran to their full capacity, and the consumption of cotton was the largest in the history of the industry. Apparently, at the beginning of the new cotton year, there had been an absorption on the part of the public of all goods manufactured, except in the instance of a few special lines. Since, however, the present cotton season, except in limited periods, there has not been activity of demand for goods nor demand at prices affording a profit to the manufacturer.

The first three months of the present cotton season, as had been the last three months of the preceding season, were, as a general proposition, a period of advancing prices of the raw material. During such period those mills who were fortunate enough to have an ample supply of the raw material had handsome results, but these results were really the profit of the disposition of the raw material rather than profit in manufacturing. Indeed, cotton manufacturing has now degenerated into that condition when profitable results are no longer a matter of good management in manufacturing, but are dependent almost altogether upon the judgment exercised in the purchase of the raw material, or rather, I would say, the luck attending such purchase. The constant and extreme fluctuations in the raw material have become such as to overbalance in influence all other subjects entering into the value of the product.

So far as these fluctuations are the result of varying conditions in the production of the raw material, the manufacturer cannot complain; such must be accepted as the unfortunate conditions of the industry; but if fluctuations are the result of causes not natural, but, on the contrary, manipulative, or if the natural fluctuations are exaggerated through manipulative influences, then the manufacturer has a good cause of complaint.

As a general proposition, it is not to be expected that the buyer shall be the one to seek the advance of that which he has to purchase. Manufacturers are but human, and naturally seek to buy that which they must use at the lowest market price. As between ourselves, each manufacturer is interested in purchasing his raw material at a lower price than his competitor, for thereby he is given an advantage in contract; but it does not follow that the manufacturer is interested in an effort to depress the market basis of the raw material, for experience has shown that the buyer of goods endeavors likewise to depress the market for goods in the same relation that there is a lower basis for the raw material. If you should take an average of the past fifteen years, it would be shown that the periods of greatest hardship in manufacturing have been those in which the basis of the raw material was lowest; so it does not by any means follow that low raw material makes profitable results in manufacture any more than it follows that extremely high tends to such results. Generally stated, the best results have been obtained in those periods when there was a steadiness in raw



MEMBERS AND GUESTS AT THE CHARLOTTE CONVENTION.

material, or a slight advancing tendency. This steadiness and advancing tendency seem to give buyers of goods a confidence in the purchase of their supplies, so as to yield to the manufacturer a profitable result.

It must be admitted, on our part, that a portion, at least, of the unfortunate results of the past year is due to ourselves. Throughout last summer and the early fall, manufacturers, as a whole, resisted the advance of the raw material, which was consequent upon the shortage of supply. We apparently were slow to appreciate how short, indeed, was the supply, and were much behind, in this appreciation, of the speculative element which foresaw conditions much better than we did. Our own distrust in prices of the raw material, our own disbelief in the justification and permanency of those prices, were necessarily communicated to buyers of goods, and this distrust on the part of buyers was increased when, during the fall and winter, there were violent reactions in price.

If there be raw material of any character in a high price for which the country at large is interested, it is cotton, for so large a proportion of cotton—approximately three-fifths of the production—is exported. A nation is benefited when it sells its own products at high prices and buys the products of other nations at low prices. The export value of cotton runs up into the hundreds of millions, and preserves in our favor that balance of trade regarded so necessary in financial circles. By higher prices the prosperity of a large section of the nation is made sure, and the consumptive power of many millions of people is increased. The cost of living throughout the whole United States, as is notorious, has greatly increased; all food-stuff has risen in value, and most lines of manufactured articles. The farmer who produced cotton has found a steady increase in his costs of production; the wages have increased, for in my boyhood days on the farm the farm-hand was employed at a wage of six to eight dollars a month and scanty rations, whereas the same farm-hand today receives fifteen to twenty-five dollars per month, with more bountiful rations. It is therefore natural that the planter should expect and demand a higher price for his product. This product must be expected to be upon a higher level of price than it has been in times past, and even the relatively high price prevailing during the last fall and winter, and now prevailing, is not out of proportion to other agricultural products and to the great mass of manufactured articles, many of these having risen in value, as compared with conditions of 30 years ago, 100 per cent.; whereas, cotton today is not above 50 per cent. higher than what may be termed its normal price in times past.

There must, therefore, be recognition on our part that a new price level in cotton is both proper and necessary, and that we must bend our energies, not in the effort to reduce this price level, but in the effort to convince buyers of its necessity and propriety, and of the necessity, therefore, of a consequent rise in the price of manufactured products. It has been now nearly thirty years since I entered business life, and yet do I well recall that in the fall of 1882 one of the most standard of bleached goods was sold for the first time at ten cents a yard, and that it was regarded as remarkably cheap. Since that time we have seen that same product decline to six cents a yard, and now, notwithstanding all the advances in raw material and in wages, it does not equal on the market the price of flour, the living most is greatly increased, in recent years, considerable advance in wages in cotton manufacturing, yet the fact remains today, as has long been a fact, that wages in the cotton mill industry are below the scale of wages prevailing in almost all other skilled industries. We must naturally expect, therefore, continuous advancement in wages, and the necessity of struggling for advancement in the price of our product will become greater and greater.

In place, therefore, of in any sense lending our energies towards the depression of price of the raw material, the thoughts of all of us, as manufacturers, should be, and must be, directed towards acquainting buyers and customers with the conditions affecting us, awakening in them a realization of the necessity of a higher cost of cotton goods. To a family which has a material advance in the price of flour, the living cost is greatly increased, but the cost to such a family of an increase in cotton goods is almost unappreciable. It cannot affect materially the wage-earner whether he pays 75 or 90 cents for the shirt which he wears;; yet, if that difference of 15 cents is to be paid as a recognition of the increased cost of the cotton and labor in the shirt, the difference to us as manufacturers, to our employes, and to the farming community which raises the cotton, will be very great.

A part, therefore, unquestionably of the misfortunes of the past year has been due to the tendency of ourselves to depreciate the value of the raw material we use, the value of which, notwithstanding our efforts, has risen in great degree, consequent upon that inevitable law of supply and demand. There is no reason today for us to believe that we are to see, at least in the coming year (if natural laws are to prevail), any serious reduction in the price of our raw material. The mills, by September 1st, next, will have been denuded of their entire reserve stock, as they had been on Sept. 1, 1908. A bumper crop is necessary for the next year to supply the actual demands of the world and to reestablish to the mills that reserve which is necessary for their comfort and well being. Even if a crop of 14,000,000 bales be raised during the coming year, there is reason to believe under natural conditions, and in view of the constant increase of the uses of cotton for manufacturing purposes, and in different characters of goods, that the price prevailing throughout another year will be much above that price which we have heretofore considered as the normal price. Essentially, therefore, should our efforts as manufacturers be directed to an increase in the price of our product.

There is no necessary conflict between the manufacturer and the producer, and there should be no feeling on the part of the manufacturer that he desires to see a reduction in price of raw material below that which would yield to the producer a

fair return, and, indeed, a good return for his labor; but, owing to conditions beyond our control, in the past the manufacturer has learned by dear experience that it matters not what the supply, and it matters not what the demand, there will be violent fluctuations in the raw material, and that these violent fluctuations tend to unsettle trade and to throw the burdens thereof entirely upon him. We have all been so scorched by purchasing raw material at a price which seemed fully justified to us by conditions of trade and by supply, and yet have seen this price so affected by influences not justified by these natural laws, but rather by manipulation of speculators and gamblers, that we have all become timid in the purchase of our raw material.

Unquestionably, a steady market and a market which recognizes an added value in the spring of the year, consequent upon interest and carrying charges, is desired by all manufacturers. To such market, even though it be a high value, the mills could readily adjust themselves, were it not for the fear that through the influence of others not connected with the trade there would be depression in price, giving to some competitor, who has not purchased his cotton earlier in the season, the opportunity to purchase at a price which enables him to undersell us and thereby tend to lower the price of that which we manufacture.

It is folly, therefore, for any manufacturer to claim that he is not interested in the manipulations of the cotton market, or that he is not interested in the effect upon the raw material of cotton exchanges whose rules and whose methods tend towards the manipulation of the price of the raw material. In the early part of February there was a discussion in Washington, before the Congressional Committee on Agriculture, of the various bills proposed to control and limit operations on the various cotton exchanges. The purport of these bills was to limit the operations on the exchanges to those who in good faith intended to sell the product or in good faith to receive it by purchase; to limit, and, if possible, prevent the operations of those who had no such intents, and whose only purpose was to speculate through these exchanges and to seek to control the price of contracts on the exchanges to their own profit. The principal cotton exchanges in the United States do not make a record of the quantity of the transactions occurring on their exchanges. There is no positive record of the amount of sales and purchases on these exchanges; yet there is good reason to believe that on these exchanges the cotton crop is sold and purchased in the course of a year from ten to forty times the amount of the crop actually grown. This is a day of great aggregation of capital; it is a day in which individuals, by speculation or fortuitous circumstances, have amassed great wealth, and when these enormous operations go on upon our exchanges, vast power of influencing the price of the raw material is given to these aggregations of capital. There is no relation between the price of contracts on the exchanges and the actual price of spot cotton, owing to the great extent of these operations on the exchanges. Our experience in the past has been that, with a very few exceptions, we are not able by any means to purchase our raw material at the price indicated by the exchange. A very wrong conception is thereby given to the public at large, and to buyers of goods, as to the price this raw material actually costs the manufacturers. The effect of this misconception is to make the public and the buyers of goods resist advances in price necessary and consequent upon advances in the price of raw material. At times we have seen a disparity between the price on the exchanges and of spot cotton as much as 2 1/2 and 3 cents per pound, and this disparity in itself, in many classes of our goods, would be a good profit to us.

This Association has, in its previous proceedings, recognized the effect upon our industry of the manipulation of prices. In a report presented to the Association by our distinguished Chairman of the Board of Governors, Capt. E. A. Smyth, recognition was made of the successful effort of the Southern grower of cotton to secure a higher basis of price for his product, in these words: "Your committee would heartily congratulate the planters of the South upon the remarkable manner in which, notwithstanding adverse conditions and times, and the adverse conditions on the exchanges, they have been able by the exercise of good business judgment to dispose of their crop at fairly remunerative prices. Your committee feels that, were it not for the strength of the farmers in the South, under whose conditions very low prices would have been obtained during the past season, and therefore most heartily congratulate our farmer friends upon the excellent manner in which they have managed the disposal of their crop during the past season."

In the same report, in referring to the question of price of the raw material, the committee said: "It may be said in this connection that low prices of cotton, as also great variance in prices, in any season, are altogether as much to the detriment of the spinner as they are to the planter himself. What is desired by both parties is a fair value to the commodity, allowing to the producer a fair profit in the raising, and fixing in some measure a stable price upon which the spinner can calculate in making his sales."

These views have been adopted by this Association as representing their views, and have received the unanimous endorsement of the Association. In the same report it was pointed out: "These two results cannot be secured under present conditions on the exchanges, and particularly on the New York Exchange, and your committee does not feel that it can conclude its report without expressing its disapproval of the contract of the New York Exchange, and a sincere hope that the leaders on the New York Exchange will realize the defects of their contract and sincerely attempt to remedy the same. Under present conditions the contract on the New York Exchange can be of value only to the speculator. It is not to the producer or to the manufacturer."

Since that period, now two years ago, constant efforts have been made by this Association, by its officers and its members, to secure a rectification of the conditions complained of. These efforts

have been of little avail, so far as the New York Cotton Exchange is concerned, and even in the case of the New Orleans Exchange conditions have not been rectified to the full extent that your committee had hoped for.

It has either been impossible to bring home to the members of the New York Cotton Exchange the fact that the rules and methods of their exchange tend to a manipulation of prices, or this manipulation of prices is desired by the members of the exchange for their own purposes and in order to insure to them business which they fear they would not otherwise receive. The amount of sales and purchases which can legitimately be made on the exchange by the producer and by the consumer of cotton is small in quantity, compared to those which are continually made by the speculator. It can therefore be appreciated that the speculator's business is to most members of the exchanges of much more moment and importance than the business of the ligitimate producer or consumer; and yet, with the influence which the exchanges have, and particularly the New York Exchange, which is today the most influential factor in determining the price of cotton, the effect of the exchange upon the producer and upon the consumer cannot be ignored. There is presented the conditions in which he who never raises a bale of cotton, who never, indeed, in the course of a season sees a bale of cotton, who never pays the producer for a bale of cotton, or who never sells a bale to the consumer, is able to control, through the exchange and through the purchases and sales on the exchange, the price of the commodity in a way that no hundreds of thousands of legitimate producers can, and in a way that no reasonable aggregation of manufacturers can. Such a condition is unjustified and should not be permitted to exist. The very lives and fortunes of too many of our fellowmen are affected by the manipulation of prices of an agricultural product upon the exchange for our Government to sit idly by and see such manipulation in price, without raising its voice against it and seeking to prevent it.

In recognition of this view, and in the belief that I was in harmony with a great majority of the members of this Association (though appearing solely for myself and speaking only for myself, disclaiming any right to speak for the Association as a body), I appeared before the committee referred to and argued in approbation of the proposed legislation limiting the use of the exchanges to those parties who were legitimately entitled thereto, namely: Those who were selling what they had or were buying what they would use. At this hearing, the singular spectacle was presented of members of the New York Cotton Exchange admitting on the one hand the great influence of this exchange on prices, admitting the effect the contracts on the exchange had upon prices, and yet claiming that the public at large, the producer who raised the raw material, the manufacturer who bought it, and the consumer who used the manufactured product, were not interested in the operations of the exchange and had no right to be heard as to such operations.

I have no fight to make against the cotton exchange if it exercises its legitimate functions and is not a device for manipulation of prices. I have not even censure of the speculator who legitimately exercises his judgment as to the price of a commodity and legitimately purchases with the expectation of receiving the commodity, or who, having a commodity, legitimately sells it on the exchange with the expectation of delivering it. An interesting writer, himself a member of the New York Cotton Exchange—Charles C. Cowan—has lately distinguished between speculation and gambling in a clear manner, defining the distinction as follows: "The man whose optimism or pessimism inspires him to buy that which another possesses

LEWIS W. PARKER, THE RETIRING PRESIDENT OF THE AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

in some form, or sell that which he possesses, either for immediate or future delivery, as may suit his convenience, is a speculator. The man who sells that which he does not possess is a gambler."

Gambling on a cotton exchange is just as bad, in every particular, as gambling in any other form, and should be prohibited by law. He who is buying that for which he has no use, or which he is unable to pay for, and which he has no expectation of receiving, is a gambler. Likewise is he who is selling that which he has not, which does not belong to him, and which he does not expect to deliver. It is useless to argue that the great mass of operations on the cotton exchanges, and particularly on the New York Cotton Exchange, are made with the sincere intention of either delivering that which is sold or accepting that which is bought; the intention, as is well known, judged by the knowledge of the course pursued by those operating on the exchanges, is that a very great

per cent. of the operations are simply with the expectation of settling upon differences.

If these actions on the exchange affected simply those who entered into agreements or contracts, then, possibly, there would not be the same concern as there must be when it is appreciated that their results are to seriously affect many others—producers and consumers—who see that commodity in which they are interested seriously affected in price by the actions of those others whose only concern is with a question of the profits hoped for through their operations. The barkeeper who makes sales to the inebriate never sees the justice of a prohibition law. The gambler who invited others to his den with a view of fleecing them never sees any justice in a law which seeks to protect those who are weak. Likewise, apparently, a majority of the members of the New York Exchange see no justice in provisions which would protect the producer and the manufacturer from the result of illegitimate conditions.

As has been pointed out in the proceedings of this Association, the contract of the New York Cotton Exchange is essentially a seller's contract. It is essentially a contract, the effect of which is, on the average, to depress the price of the commodity to the extent that advantages are given to the seller in contrast with the buyer. It is a contract the effect of which is to mislead generally the public as to the value of the commodity traded in, and, in general (though there are exceptions to this statement), to give an impression of a value of this commodity below that which it commands on the market. Those clauses of the contract which have this effect have been heretofore pointed out by this Association, and the Association has earnestly urged a rectification of those injustices. Notwithstanding the repeated requests of both producer and manufacturer for a correction of these abuses, the New York Cotton Exchange has continued to preserve those features in its contracts which are so objectionable.

What is the policy to be pursued by this Association? Shall it merely reaffirm its previous positions, or shall it, recognizing the fact that its own industry is being seriously affected, call upon the powers which can remedy the trouble to exercise rights of government and prevent a continuation of the evil? To my mind the answer is conclusive: that there must be action by government to protect interested parties, if the exchanges will not themselves regulate their contract so as to be fair and just to both buyer and seller, and if they will not so regulate their contract as to make much less, if not, indeed, to prohibit altogether, that manipulation of prices which we so constantly see. It is an absurdity when prices vary, as they do on the exchanges, without reference at all to the natural conditions of supply and demand, and without reference to the prevailing prices for the actual commodity.

I would therefore recommend that this Association pass resolutions approving the policy of the bill now pending in Congress, known as the "Scott Anti-Option Bill."

Of only less importance to the manufacturer than the subject just discussed, is that of the provisions to be considered as a part of any sale of product made by the manufacturer. These provisions have been most carefully considered during the past two years by a committee known as the Committee on Uniform Sales Contract, and this committee will make a report at this meeting, indicating that considerable progress has been made in the adoption of this contract. The buyers of goods, through representative committees, have manifested their interest in the proposed contract, and have been of material assistance in perfecting it. Doubtless, it will be necessary to continue the committee for another year, though there is every indication that material progress is being made and that a satisfactory result will be finally obtained.

An article will be read at this meeting of the Association upon the subject of "Excess Tare," a question which is of the greatest importance to us as manufacturers of cotton, for there has been a tendency in recent years to increase very considerably the amount of tare on cotton bales. This Association, and other similar associations, must endeavor to bring clearly to the attention of our producing friends the fact that such excess tare does not, in the end, benefit the producer, but on the contrary, is a distinct, additional burden to him. In the discussion of this, as any other matters of similar nature, I urge that the members join freely, for it is only by interchange of thought that this Association can be of the greatest benefit to members. As one means of accomplishing the limitation of tare on cotton bales, the success of "gin-compressing," as pointed out at a previous meeting of the Association, would be most potent. As an incident to this success satisfactory freight rates should be obtained for gin-compressed cotton, as distinguished from the ordinary compressed cotton, or the ordinary square bales. I understand that the subject of these freight rates is now under discussion by railway traffic managers, and I would recommend the adoption by this Association of resolutions urging that gin-compression be encouraged by the granting of reasonable freight rates on cotton thus baled.

In conclusion, I would extend to you my most sincere thanks for the honor you have done me in promoting me to the office of President of the Association; in such way as I could I have, during the year, given my time and thought to the interests of the Association, and although it may appear that little has been accomplished I can assure you, at least, that there has been an earnest effort and desire. I would extend particularly to the Secretary of the Association my thanks for the many courtesies shown me during the year, and my appreciation of that ability and zeal which have always marked him in the discharge of his work for the Association. The committees of the Association have, doubtless, during the year discharged all the work assigned to them, and the Board of Governors have had several meetings upon matters connected with the affairs of the Association, and cotton manufacturing in general. I feel that during the year something, at least, has been accomplished, and can only wish that my successor in office shall be able to do more than I have in the promotion of matters for the good of the Association, and affecting the industry at large.

(Continued on page 192.)

The National Association of Hosiery and Underwear Manufacturers.

The sixth annual convention of this organization was held in Philadelphia on May 24 to 27. An address of welcome was delivered by Mayor John T. Reyburn in which he made emphatic references to the tariff question and the policy of the State Department in regard to our foreign trade relations. He said in part:

The matters of tariff and production are not local, but are as wide as the country. We, as manufacturers, must take care that our laborers are better housed, better clothed and better fed. It is my firm belief that the employer is a benefactor to the entire country and deserves consideration by the law. I do not agree with all this talk about a commission to revise the tariff. After all, the subject must revert to the people who possess a knowledge regarding it, and they are the ones who must settle matters. We believe in building up and strengthening manufacturers by reference to the domestic section of the industry. It seems to me that the State Department would trade every manufacturer in the country for some imagined advantage to be obtained abroad. Such a company of men ought not to be trusted with the fixing of the tariff.

President Simons then delivered his address which was as follows:

I want to say to you a few words upon a subject of which we are all heartily sick and tired, but the importance of which looms so largely on my mind that I should feel guilty if I failed to avail myself of the opportunity of speaking while yet my words are clothed with whatever of importance the office with which you have honored me may confer upon them. I refer to the attitude of the country in relation to the tariff question. I am not going to anticipate the report of your tariff committee, and if I am pessimistic it is not because I wish to be so, but because history shows that the business of the country was never in a satisfactory condition during times of tariff uncertainty and threatened revision; and as I can see no prospect of the cessation of tariff agitation, the outlook does not present to my view the hopeful prospect it otherwise would do.

GARNETT ANDREWS, ELECTED PRESIDENT OF THE NATIONAL ASSOCIATION OF HOSIERY AND UNDERWEAR MANUFACTURERS.

I would like to state that in dissenting as I do from the tariff policy of the national administration, and if it is true that Mr. Taft is carrying out Mr. Roosevelt's tariff policy then also from that of the previous administration, I do so with great respect. I have always been a great admirer of Mr. Roosevelt and am so on record in this association and I am confident Mr. Taft is inspired by motives of patriotism. But I differ from them and if I exaggerate the importance of protection I do so conscientiously and stand ready to defend my position by giving a reason for the faith that is in me.

If this country, under a policy of protection, has within a few decades advanced from comparative obscurity to a foremost position among the nations, if from being comparatively poor she has become enormously rich, if her people are the best conditioned in the world—and no honest competent observer will deny that they are, why abandon the policy under which this great progress has been accomplished?

It is said of men of great activities that they may make mistakes, but that they never make the mistake of doing nothing. I don't believe in the do nothing policy, but I protest that in matters of statecraft involving momentous consequences to a great nation it is much better to do nothing than to do wrong, and that a policy of "masterly inactivity" is better than a feverish hysterical effort to put into operation reforms that have received but scant consideration and which may after all prove to be no reforms at all.

The tariff reformers profess to be animated and inspired by the desire to benefit the ultimate consumer and to protect him from the greed of the producer, but the producer and the consumer are one. Show me a consumer who is not a producer and I will show you a parasite. I use the word in no offensive sense, for there is need of non-producing labor, but the fact remains that it is non-producing and must draw its substance from the producer. Therefore whatever affects the producer either for good or evil affects the non-producer likewise.

The tariff reformers profess to be scientific protectionists, but their very definition of what constitutes proper protection carries with it its own refutation: the assertion that the protection afforded should be equivalent to the difference in cost of labor here and abroad is at once an admission that protection has enabled American labor to secure higher wages than foreign labor, and a protestation that it ought not to be allowed to further increase its advantage.

Let me direct your attention to what I conceive to be the very unfortunate position occupied by some three hundred thousand American citizens. Of course, in such a large body as that you will always find some black sheep, but taken as a whole, I believe the men I refer to are not second in ability or in the character of their manhood to any other class of men in existence; and yet by a great part of the population of this country the captains of industry, great and small, are regarded as so many grafters, living by extortion and fattening on the vitals of an oppressed and downtrodden people.

It is a fact easily capable of demonstration that neither the capital nor the labor engaged in manufacturing is over compensated, but who can wonder at the unsatisfactory relations existing between capital and labor when every demagogue in the country is shouting "stop thief" after the manufacturer?

The idea that protection is a special advantage given to the manufacturers at the expense of the nation is wrong. If that is not so, then protection in any form is wrong and the producer is guilty of graft as charged.

Are the three hundred thousand manufacturers in this country grafters? Are they and their six or seven millions of employes recipients of the charity of the nation? They are not. They receive no better compensation than those engaged in commerce or agriculture, and they derive no greater benefits from the protection afforded by duties on imports.

It is a fact palpable to the most observant that the millions of working people who are employed in the manufacturing industries are no better compensated and no better conditioned than those employed in commerce or agriculture. It is a fact that the manufacturers of this country make smaller profits than the merchants and have not accumulated so much money. Both the farming interests and the trading interests are and have been more prosperous and better compensated than the manufacturing interests.

From the time of the passage of the Dingley bill to the recent panic the manufacturing interests were steadily employed and were on the average very prosperous, but were they more prosperous than the farming interests? Consider the prices farmers are getting today as compared with fifteen years ago; consider the stupendous total of the mortgages they have paid off in the interval; consider the tremendous increase on the value of their properties and then please tell me how much the manufacturing interests have had the best of the game.

I don't know that I can quote any authority for the statement that the manufacturers of the United States are today working upon a smaller margin of profit than the manufacturers of any other great nation in the world; but I firmly believe such to be the case and that it has been brought about by the steadiness with which they have been running their plants to full capacity during the operation of the Dingley tariff.

There can be no valid argument in favor of a reduction of the tariff that is not based on the assumption that the domestic producer is making an abnormal and unjust profit; and the producers, at any rate the manufacturers, are not making such a profit; to quote the exception is only to prove the rule.

Moreover the government is in possession of information and is now acquiring information of the most authentic and reliable character from which it can readily satisfy itself of the truth in regard to the matter. I refer to the figures furnished by all manufacturers of the country to the census bureau at Washington; those figures are furnished to the Government in confidence under the assurance that they will be used only for statistical purposes and the manufacturers have absolutely no reason to make false returns. They

prove conclusively that the manufacturers do not make excessive profits.

The figures of the census now being taken are, of course, not yet available, but there is no reason to believe they will indicate any greater profits for the manufacturers than those of the last census. Referring to Bulletin 57 of the Department of Commerce and Labor on page 25 you will find table 9, a comparative summary of all the manufacturing industries divided into 14 groups. It gives the number of establishments, the capital employed, the number of salaried officials and the total amount of their salaries, the number of wage earners and their total wages, the miscellaneous expenses, the cost of materials and the total value of the products.

Taking the grand totals, the figures indicate that the cost of production falls short of the value of the product by a fraction over 11 per cent., but the body of the report states that the "census data should not be used to compute profits, as there are many items of expense such as allowances for depreciation of plant, bad debts, etc., that are not considered in the census schedule."

Now, without taking into account the "bad debts, etc.," referred to and assuming that the only item of expense not enumerated in the census figures is depreciation, I submit to you or to anyone competent to form any conclusion in the matter that a reasonable charge for depreciation would make the Government's figures show that the average profit of the American manufacturer is the smallest profit possible that is compatible with the continuance of the prosperity and progress of our industries; and it is not all available for disbursement at that, for if the manufacturer is to continue in business he must make provision not only for depreciation, but also for expansion; he must be prepared not only to maintain the efficiency of his plant, but also to increase it by the purchase of all improved machinery and appliances, so that even his net profits are not all available for disbursement.

I have spoken to you only of the gross figures covering all branches of the manufacturing industries. Some of the groups of industries show up better than others, of course, but I think few if any show excessive profits. Taking your own business, that of hosiery and knit goods, the Government's own figures indicate a gross profit of just about 10 per cent. out of which you must provide for depreciation, bad debts, etc. Passing by the bad debts part of it, I say that if the Government would appoint a competent commission to ascertain the average approximate depreciation of American knitting machinery and then apply those figures to the figures already in its possession, it would prove that the net profits of the hosiery and knit goods manufacturers do not exceed 2 1/2 or 3 per cent. of the value of their product.

The manufacturers of the United States are not grafters and if Congress is not satisfied that such is the case then the way to determine the question is to ascertain from the information already in its possession what the profits of the manufacturers are, instead of undertaking the utterly impossible task of determining "the permanent differential between the cost of production here and abroad."

The real cost of production is obtainable only after the business has been done, and that from the profit and loss account—the balance sheet. Any costing figures that are not sustained by the profits made or the loss sustained are inaccurate.

For these reasons I disapprove of the creation of a tariff commission with powers and duties as defined by President Taft. If Congress needs assistance at all it needs the assistance of a commission of competent accountants, men who do not get rattled by big figures, but who can draw up a true balance sheet and then prove that it is a true one.

The manufacturers of the country have been abused and maligned and slandered long enough, and the charge made against them is definite enough; why not take the bull by the horns and prove the charge is false in the only manner in which it is possible to prove it false and that is by a complete "show down."

They say we have stacked the cards, threw them on the table face up, demand an inquiry by a commission having all the powers of an inquisition.

Just a minute more and I am through. I would like to call your attention to the fact that the magazine editors are playing the manufacturers for a "soft thing." They are doing everything they possibly can to injure the manufacturers in the eyes of the people, charging the cost of doing the job up to the manufacturers and at the same time touching them for profits that would make the average manufacturer die of heart failure.

Some time ago one of them published an article purporting to prove from the figures of the last industrial census that all labor received was 18 per cent. of the value of its products. I answered that article the best I was able, pleading with the editors to publish my letter not only in the interests of justice, but also in the interests of labor. They refused to do so, but that did not prevent them sending me a letter soliciting advertising, in which they set forth that the current issue of one of their publications contained nearly eighty thousand dollars' worth of advertisements from textile manufacturers alone and that the amount was only an average one. Think of it, gentlemen, think of the fact that the textile men alone furnish to one magazine nearly a million dollars annually.

Last month one of the magazines published an attack on Speaker Cannon; it was a brutal thing, just a mass of venomous abuse such as no just man would write and no just printer would publish. I noticed that the same issue contained several full page hosiery advertisements, I believe from members of this association, and I wish to say that if the manufacturers of the country used proper discretion in placing their advertising there would not be a magazine editor in the country who did not conscientiously believe that Uncle Joe was the finest old gentleman that ever wielded a gavel.

All I can say is that if the manufacturers are going to continue to pay scores of millions annually (it may be hundreds of millions for aught I know) to help their enemies to destroy them, then I hope they will get all the tariff reform they are paying for.

Charles H. Porter of the New Bedford Textile School then addressed the meeting

on Technical Education in the Knitting Industry, in which he called attention to the progress made by his school in this important branch of textile education.

At the meeting on the second day, Wednesday, two papers were read, one on Strike Insurance by Fred T. Crichton, of the Employers' Indemnity Co., and the other on the Dyeing of Hosiery, by Dr. C. Fisher, of the Berlin Aniline Works.

"Strike Insurance."

By FRED T. CRICHTON, of the Employers' Indemnity Co.

The problem of strike insurance, or the plan of indemnifying employers of labor against strike losses has at last been reduced to a basis of scientific accuracy. It will not be necessary for me to dwell at any length on the psychology of strikes as a great number of you gentlemen have undoubtedly experienced the aggressive method of the labor agitators. Insurance in any form as you well know "Is an act of assuring against loss or damage whereby one party undertakes to indemnify the other against loss by certain risks."

Did you stop to think that a strike is deliberately planned to cause a financial loss. It is the only one condition in your business that at present time is not protected by using those same cooperative means which have proven so successful in the case of fire and other unpreventable misfortunes. In the past thirty years American manufacturers have sustained a loss owing to strikes of over $159,0000,000—a total loss never to be recovered. From the year 1881 to 1905 there were strikes in 181,407 establishments in the United States. It seems incredible that so great a source of national waste should not sooner have been checked. In Europe, England, Germany and France strike insurance has existed since 1880. In Germany alone at the present time there are 48 companies in successful operation.

The Imperial Labor Bulletin of Germany reports 2,400,000,000 marks—equal to $600,000,000 of strike insurance carried by employers of labor in the German empire in the year 1909. There was considerably more than two billion marks carried as a matter of fact, as 13 companies declined to make a report of their business to the statistical department. Here are a few of the companies and the volume of business written by them: The United German Employers' Association for Loss by Strikes, 111,090,307 marks. The United Association of German Metal Industries for Loss by Strikes 48,904.870 marks. The Employers' Union for Indemnity for Loss by Strikes, 13,784,874 marks. The Hamburg-Altoona Employers' League for Protection against Strikes, 13,518,120 marks. The League of Employers of the Saxonia Industry, 45,500,000 marks. The League of Mine Industries for Losses against Strikes, 74,000,000 marks.

Talbot J. Albert, American Consul at Brunswick, Germany, in a recent report to the State Department at Washington, D. C., says: "The numerous strikes which have taken place in Germany have caused industrial employers to use all means for self-protection and self-preservation against attacks of labor. While the workmen must suffer deprivation during the strike, they have nothing to lose. When the funds of the union are exhausted the striker is supported by contributions from other labor organizations.

"Severe material damage is done the employer by a strike. The factory lies idle and suffers depreciation from want of use. Production ceases and the employer in these days of keen competition is exposed to the danger of being driven out of the market, which he has with difficulty acquired. As the stoppage of work generally takes place at times of greatest prosperity, when orders are numerous, he is likely to lose many of his customers to competitors.

"This unfavorable position of industry as compared with labor, which is supported by its system of organization, has brought about insurance against loss by strike. The extent to which it prevails may be judged from official statistics just published. According to the bureau of statistics there are in all 48 companies.

"The number of its adherents increases from year to year, showing its economical usefulness. The fact that it strengthens the position of the employer against the attacks of labor is evidenced by the diminished number of strikes with their unhappy consequences."

A manufacturer as a rule has neither time, capital nor inclination to carry his own insurance. It is preferable to have some one else shoulder the burden of responsibility in the time of strike. This is possible in strike insurance. It can be done along the same lines and using the same principles of underwriting as in other forms of insurance. The plan of operation to be used by the Employers' Indemnity Co. of West Virginia is slightly different from that in vogue in Germany. It will issue a policy covering net profits and fixed charges for a stipulated amount of insurance based on so much per day and charging a flat rate-level premium. For instance, assuming your estimated net profits were $50 per day and your fixed charges were $50 per day a policy would be issued for $30,000, giving indemnity of $100 per day for 300 working days. A fiat rate of seven-tenths of one per cent. will be the minimum rate and will not exceed one per cent. on any line of business.

This plan is conceded by leading actuaries to be as perfect a basis as human ingenuity can devise. It entirely eliminates the weak points so generally in use in Europe which are based in the total amount of the pay-roll. The plan of adjusting claims is far more simple than the average fire claim, and in the event of a dispute arising the present system of using arbitrators or an umpire will be employed.

William Francis Bernard, Fellow, American Institute of Actuaries, in a report on strike insurance says: "Indemnity against strikes, or rather strike losses, does not differ essentially from any other form of insurance, it being practically a matter of risk on the one hand, and price on the other. There are three elements which enter into every legitimate form of insurance. First, there must be material value—value capable of expression in terms of dollars and cents—else there is

nothing to insure. Second, there must be risk of loss of this value, or there is no motive for insurance, and third, there must be a means whereby this risk of loss may be pre-estimated with a reasonable degree of accuracy, for otherwise there is no basis for an equitable contract. To my mind, all three of these elements are present in the case of the proposed strike insurance, and therefore the enterprise would not be one of a highly speculative sort, but could be undertaken confidently by investors and patronized with equal confidence by employers of labor."

In Germany one of the companies in operation paid in losses in 1909 only one-third of the amount paid in 1907 and the volume of business written in 1909 by that company had increased 28 per cent. It is generally conceded in Germany that strike insurance has been the direct cause of the reduction in the number of strikes. To show you what the American labor leader thinks of strike insurance I will read a quotation taken from a three-column editorial published in the Chicago Daily Socialist, and reprinted in every labor paper in the United States: "The Employers' Indemnity Co., with a capital of $500,000, is being floated for the purpose of furnishing strike insurance to employers and thus beating discontented workmen before they go on strike. Strikes will cost the employer nothing, they will cost the union everything. It is the nucleus of a powerful corporation. It will form a force which will seek to make strikes impossible. A strike which costs the employer nothing is lost as soon as started."

That is the opinion of an editor of a labor journal. There is no doubt that strike insurance will be the means of preventing strikes and will give the employer of labor a great deal of courage when confronted with a serious loss. The smaller manufacturer will now be in a position to fight the unjust demand which has heretofore been almost impossible. It will make possible a continuance of profits the same as if his business had not been interrupted and it will maintain and protect his credit. Any individual or firm may become suddenly involved if threatened with labor troubles. The cost of strike insurance will gradually be reduced from year to year as strikes become less frequent.

It will perhaps surprise you to know that at the present time there is over $50,000,000,000 of available insurance in the United States for a strike insurance company. Of course it will be impossible for any one company to carry the entire risk of a large plant, but insurance for the full amount can be applied for as a reinsurance arrangement will be entered into with some of the European companies to carry the surplus in excess of the limit of liability decided upon by the Employers' Indemnity Co. of West Virginia.

Gentlemen, strike insurance is the solution of the labor question and is the logical remedy for strikes.

The production of sea island cotton in 1908 was 93,858 bales, equivalent to 36,538,239 pounds. Nearly 27 per cent. of the crop was exported.

Dyeing of Hosiery.

By DR. C. FISCHER, Berlin Aniline Works, New York.

For several years, however, there has been a ing qualities, goods that would last longer than a day or two, stockings that would not have to be taken off full of holes at night after they had been put on brand new for first time in the morning. Aniline black, that is the oridized or aged black, will tender the fiber more or less, especially when the goods are subjected to the lisling process in the oxidizing room. The latter process has a very detrimental effect on the strength of the goods, as everybody knows. When the demand arose for goods of better wearing qualities a new field opened itself to developed colors and sulphur colors. The manufacturing of cotton hosiery is a very important branch, we might say the most important one of the hosiery industry and therefore we shall consider the dyeing of cotton hosiery in the first place.

Good results in the dyehouse depend on a good many different circumstances. There is, first of all, the dyehouse itself with the more or less efficient facilities. The dyehouse should be on the ground floor, should have plenty of room, plenty of light, good drainage and ventilation. There should be an abundance of water and good live steam. Machinery should be properly selected for the purpose it is intended for and kept clean and in perfect running condition. Special attention should be paid to the condition of the water. Hard water will cause considerable trouble in the softening process by forming lime soap with the soap contained in the softener. The hardness of the water does not play as important a part in the dyeing of direct colors, sulphur colors and aniline black as it does in the softening process. Where the water is hard it should be corrected chemically in a softening plant, of which there are several types in existence.

In the softening plant calcium or lime salt and magnesium salts, both of which cause hardness of the water, are precipitated by adding milk of lime or lime water and a solution of soda ash in proper proportions to the water. The precipitate settled at the bottom of the apparatus and the water after having passed a filter is kept in a large storage tank. As to the condition of the material to be dyed, there is no question that the same should be free from impurities, in other words, it should be clean. For light shades and fancy shades cleanliness is a primary requirement; if necessary the goods should be scoured before they are dyed.

Oil spots are the cause of a good deal of trouble and of many complaints. They most generally originate in the knitting room and if the oiling of the knitting machines is not carried out in a careful manner the goods will become spotted and soiled with oil. There are so-called stainless oils on the market which, it is claimed, will not produce any spots, but unless they consist of oils of vegetable or animal origin, oils that can be easily saponified, they will not prevent spots. Machine oils composed of mineral oils will produce spots that cannot be removed, spots that will always show up, especially on tans and blacks, except on aniline black.

The best and only way of avoiding oil spots is by practicing a little more care in oiling the knitting machines. Oil spots can also be caused in the softening process by using an imperfect emulsion of soap and oil. As a rule the goods are singed before dyeing in order to remove the nap or lint. In most cases, especially for direct colors when the dyeing process is a comparatively short one, this is quite sufficient and good results will be obtained as far as the finish is concerned.

The simplest way of dyeing hosiery is the dyeing in an open vat consisting of an oblong box with false bottom and the proper steam and water connections. The goods are worked by hand by means of poles. From 75 to 100 pounds of goods are dyed as a rule in these open vats.

After the dyeing the goods are rinsed in the same tank or if a standing dye bath is used, taken out on a rack, allowed to drain off and washed in another tub. It takes at least two men to run an open vat successfully. Although good results will be obtained with proper attention, as far as shade and evenness are concerned, machines will be found more economical, by saving time and labor.

The principal styles of hosiery dyeing machines are either of the rotary or the paddle-wheel type. The rotary machines, as well as the paddle-wheel machines, have been in existence for a long time. The first one especially as washing and chroming machines and the paddle-wheel machines for dyeing fancy shades.

Of late both types of machines have been adapted for the dyeing of sulphur colors, especially sulphur black. They are built entirely of iron and do not contain any brass or copper fixtures, which would be destroyed in a comparatively short time by sulphide soda. The rotary sulphur black dyeing machines have a capacity of 300 pounds of goods, while in the so-called paddle-wheel machines only 150 pounds of goods can be dyed successfully.

I have not found any difference as far as efficiency of either one of these two types of dyeing machines is concerned. They both give very good results, both in regard to shade as well as evenness.

The vacuum machines have not found much favor so far with the hosiery dyers. There is no question, however, that sooner or later these machines will be perfected to such a degree that they will also be used for hosiery. A vacuum machine that will produce perfectly level dyeings, that will allow a perfectly thorough washing, that will not be the cause of marks of creases on plain or smooth goods, will be the ideal hosiery machine, as no other machine will be able to leave the goods in their original condition as well as a machine that keeps the goods always in the same position, that does not tumble the goods about and have them all ruffled up.

In dyeing tans, blues, grays and the innumerable number of fancy shades on cotton hosiery, direct cotton colors are used as a rule. These colors will answer the purpose for the cheaper line of goods, and even for better grades of goods, they are used very extensively. The fastness of these colors to light and washing is moderate; it answers the purpose in most cases, however.

They are dyed with the addition of common salt or Glauber's salt, with or without the use of sal soda or soda ash. The goods are first thoroughly boiled out for about one-half hour in water only, or with the addition of sal soda or soda ash. After the machine has been filled with other water again a solution of the dyestuff is added at 120° F., the steam is turned on and the bath brought to the boil in about one-half hour. Then the salt is added and the boiling kept up for another half hour. Sometimes the goods are allowed to run toward the end of the dye process with the steam shut off for another 15 minutes, in order to increase the depth of the shade. After the dyeing the goods are rinsed in cold water, softened in the usual way, extracted, boarded and dried.

The most important color for the hosiery manufacturer is black. Direct colors are not used for dyeing black, or perhaps in very few cases. Aniline black obtained from aniline oil or aniline salt by means of oxidizing agents is the black that held a predominating position for a good many years, when properly dyed, it is a beautiful intense black, that no other color could approach for a long time.

Its fastness to washing and light is remarkable. It takes, however, a considerable amount of skill and accurate work is essential for the production of satisfactory results. Aniline salt, as white as possible, is the best material for dyeing a good aniline black. Some formulas call for an addition of aniline oil in order to neutralize the acidity of the solution of aniline salt. It is absolutely necessary to prepare an aniline liquor that will keep a reasonable length of time, in other words, it is necessary to make the liquor in such a way as to prevent premature forming of aniline black.

It is best to use chlorate of soda as an oxidizing agent, on account of its great solubility. The solution of the same should be mixed with a solution of the aniline salt and to this mixture a solution of sal ammoniac, as a hydroscopic salt, and finally a solution of sulphate of copper, as an oxygen carrier should be added. All these ingredients should be dissolved in as little water as possible. In some cases aluminum acetate is added to the black liquor in order to avoid tendering of the goods in the ageing room. This neutralizes the hydrochloric acid formed in the oxidizing or ageing process.

The formulas for making aniline black liquor and the conditions of working vary considerably in different works and I refrain from giving any particular recipe in favor of others, as it would be impossible to discuss all the advantages and disadvantages of the different formulas in so short a space of time.

After the goods have been saturated with the aniline black liquor of about 12-foot Tw. in a tomtom, and hydro-extracted, they are put in the ageing or oxidizing room. Uniformity in temperature and humidity in every part of the room is of vital importance. Wet and dry thermometers should be used in order to regulate both the temperature and the moisture. In the dyeing and ageing process the color of the goods changes from a grayish white into a light and finally into a dark green.

The temperature of the ager should be raised to about 94° after the goods have been entered. When the goods are dry the ageing proper begins. The steam is carefully turned on and allowed to enter the ageing room, as moist heat is required for the ageing process. The dry thermometer should register 94° F. and the wet one 86° F. The whole operation of drying and ageing takes about six to eight hours. The goods are then taken out of the oxidizing room and allowed to cool on the floor, or better on wire frames; finally they are chromed and softened. It is advisable to use some sulphur acid with the chromate of potash in the chroming process, as otherwise dyeings of a rather reddish shade would be produced.

The greening of aniline blacks, which was often the source of trouble, is caused by oxidation. The tendency of aniline black to crack or to rub off is only noticeable in dyed blacks and not in oxidized or aged blacks. The bronziness of aniline black is said to be due to overoxidation and can easily be removed by some reducing agent. The tendering of the cotton fiber is the most serious of all faults of the aniline black. There is no question that free hydrochloric acid is formed in the ageing process, which tenders the cotton on account of the formation of hydrocellulose.

This trouble can be avoided by exercising the utmost care during the whole operation and very satisfactory results will be obtained by using the proper precaution in making up the black liquor.

It is in the lisling process where the troubie begins, this process being nothing but a prolonged ageing. This is supposed to give the goods a good finish, as it takes off all the nap, but very often it is the finish of the goods, too, because in the same proportion as the fiber of the nap is weakened, the fiber in the thread is attacked by free hydrochloric acid. The goods are actually carbonized in some instances and perfectly worthless. You cannot remove the nap without tendering or weakening your goods. This is a very serious objection to aniline black, or rather to the lisle finished goods. If you don't want to lisle your goods in the ageing room you have to singe them, which is very often done in the green after the goods have left the ageing room.

On account of the difficulties in the dyeing of aniline black, and because of the many serious troubles and justified complaints, the hosiery manufacturers and dyers have looked for other colors to produce good results without incurring the danger of ruining the goods. The direct blacks are not fast enough to washing and would not produce the full and intense shade of aniline black. Much better substitutes were found in the diazotizable blacks or developed blacks, and later on in the sulphur blacks.

The dyeing of diazotizable blacks is rather complicated, but the final result is very satisfactory. These blacks are dyed like direct colors with the addition of common salt or Glauber's salt. For the start it takes 6 to 7 per cent. dyestuff, and about 4 to 5 per cent. of color are used in the standing kettle. After the dyeing, the goods are rinsed in cold water and diazotized for about 20 minutes in a fresh cold bath, containing 3 per cent. nitrite soda and 9 to 12 per cent. hydrochloric acid.

The goods are then rinsed in cold water and developed with 3/4 to 1 per cent. of meta toluylene diamine, and about 1 to 1 1/4 per cent. of soda ash for 20 to 25 minutes in a cold bath. When diazotized in copper vessels or apparatus with copper fittings, sulphuric acid should under all circumstances be employed and never hydrochloric acid as the presence of both copper and hydrochloric acid in the diazotizing bath frequently causes patchy or uneven dyeings. The process of diazotizing and developing changes the shade considerably and the better brands of these blacks produce results of great beauty and depth of shade. The fastness to washing is extraordinarily increased by the diazotizing and developing process and the dyeings are furthermore distinguished by their not altering their shade in storing.

The strength of the fiber is not affected in any way, and the finest lace and fancy goods can be dyed with these colors without any risk. The goods may be either singed in the gray or after the developing; in the latter case they will have to be dried first in a so-called raw stock drying machine, then singed, softened, and finally boarded and dried again.

Another substitute for aniline black has been found in sulphur blacks. Their introduction has revolutionized the methods of dyeing black on hosiery, and although developed blacks are still preferred by a good many manufacturers for the very best grade of goods, sulphur blacks have found so much favor in the eyes of the dyer that there is hardly any hosiery mill in the country that does not use sulphur black to a large extent. Some manufacturers have abandoned aniline black entirely, others have reduced the production of their aniline black considerably in favor of sulphur black, and others again are using, besides these two kinds of blacks, also the developed blacks.

There has been much talk against sulphur black in the beginning and when sulphur black was first put on the market a good many of these complaints were fully justified. Some blacks were not sufficiently soluble, others were very sensitive to the oxygen of the air, which caused a lot of trouble in the dyeing, and complaints were heard that sulphur black would rot the goods even worse than aniline black. All this has been gradually overcome. There are now sulphur blacks on the market that will dye just as easily as direct colors. The solubility is perfect, the black does not produce so-called sulphur spots any longer, and does not affect the strength of the goods in the least.

In order to obtain perfect results, it is necessary to wash the goods thoroughly after the dyeing. The washing of the sulphur blacks is of most vital importance, and it is this part that is very often neglected. The goods should be rinsed in cold water very thoroughly, in order to remove the excessive sulphide of soda which is used in the dyeing process. If this chemical is not removed, it will gradually neutralize and form acid salts of sulphuric acid, and this acid will carbonize in the

cotton fiber in the storing of the goods and rot the same. I have always advocated thorough washing of the goods after the dyeing, and to my knowledge we have never had any complaints from any of our customers. I have examined goods that had been stored away for years, and their strength was just as perfect as on the very first day.

The dye liquor should be kept at the same density in the standing kettle; this is another thing that has to be watched carefully. A twaddle meter should be used in order to be able to tell whether the dye liquor needs any salt to bring it up to the proper specific gravity.

It will be found that in twaddling the dye liquor at the boil one will not get a fair idea about the density of the same, as the hydrometer will register too low at so high a temperature. The best thing to do is to twaddle at a temperature of about 195° F. The first bath will not show more than about 1° Tw. as a rule, or not even that much. It is not necessary to twaddle the first two or three kettles, as one has very little trouble in obtaining equal batches for three or four consecutive dyeings, if the instructions are properly followed.

It is with the standing kettle, however, that the dyer has to use his judgment, and here it is where the twaddle meter will tell him exactly what to do. If it registers about 3° to 4° no salt will be needed; if it is less than 3°, from 5 to 10 per cent. of salt should be added. In some cases, especially where a rather short dye liquor is used, it will be found that the density is going up in spite of the fact that no salt was added. This is due to the sulphide of soda added to the dye bath, which is gradually converted into Glauber's salt. In a case like that it will be found necessary to weaken the dye liquor by drawing off one-quarter to one-third of its volume and diluting it with water. In this way the density can easily be regulated and kept up at its proper degree.

In starting a fresh bath it takes a rather high percentage of dyestuff, no matter whether sulphur black of single or double strength is used; in every instance the percentage of dyestuff in the standing kettle is just one-half of what it took for the first kettle. There are sulphur blacks of more or less solubility, and the solubility of the dyestuff regulates the amount of sulphide of soda required to help to dissolve the same. Some soda ash is added to the dye bath in order to correct the water, or, rather, to increase the alkalinity, and either common salt or Glauber's salt may be used in the dye bath.

The shade of sulphur black can be easily regulated by the amount of sulphide of soda and salt. If the dye liquor contains too little sulphide of soda and too much salt, the shade is liable to turn rather reddish; with an excess of salt the black will even be more or less bronzy. When sulphur black is reddish, brownish or bronzy, the twaddle meter, as a rule, will register too high; that is, more than 4°. In order to obtain the proper shade in this case, the amount of salt should be reduced or left out entirely. If this does not suffice, the bath should be diluted somewhat, in which case a small extra addition of dyestuff and sulphide soda should be given, in order to make up for the loss caused by diluting the dye liquor.

The dyeing of sulphur blacks is carried out at the boil or at a temperature just below the boiling point. The goods can be entered dry into the dye liquor, to which all the necessary ingredients have been previously added. Soda ash and sulphide of soda should be dissolved first before the dyestuff is added. The dye liquor should be kept at the boil while the dyestuff is dissolving. After a thorough solution has been obtained the dye liquor should be twaddled; that is to say, if it is an old dye liquor.

I have mentioned the importance of the use of the twaddle meter before, but I want to emphasize once more the necessity of twaddling an old dye liquor, as good results depend entirely upon proper attention at this particular point. The washing can be done either right in the same machine, while the dye liquor is kept in the meantime in a storage tank, or the goods are lifted out of the dye liquor in a cage by means of pneumatic hoist and washed in a separate tub. At least three cold waters should be given in order to obtain clean goods. Some dyers give a hot water toward the end of the washing process, but as sulphide of soda is easily soluble in cold water, this will not be necessary. The addition of a small percentage of acetate of soda to the last rinse water has also been recommended by some as a prevention of the formation of free acid, but we have never found it necessary.

The softening of the goods plays a very important part, and the appearance of the goods depends a good deal on selecting a proper softener. There are a good many softeners on the market, and it is the dyer's business to select the best one for his particular purposes. All softeners are emulsions of soaps, alkalies and oils. The best softener is an emulsion of a neutral soap and some oil of vegetable origin; sulphonated oils, like Turkey red oil or alizarine oil, do not produce the desired effect, as these oils will not have the same beneficial influence on the shade of the black as an oil proper.

The softeners are applied at a temperature of about 120° to 130° F. for 15 to 20 minutes.

The diazotizable blacks, as well as sulphur blacks, are very well adapted for the dyeing of yarn used in the manufacturing of white foot goods or goods with white toes and heels. Both of these blacks are very fast to washing, and will not stain the white in goods of this kind. The yarn may be dyed in open kettles on sticks, or in more up-to-date yarn dyeing machines. If open kettles are used, sulphur black should be dyed on bent sticks, in order to keep the yarn submerged as much as possible in the dye liquor.

The application of diazotizable, developed colors and sulphur colors for fancy shades is of great importance. There is a general tendency for fast colors in the textile market, and the hosiery manufacturers have been compelled to get in line. In most cases ordinary direct colors have been satisfactory, and will always be used for cheap goods, although the fastness to washing is only moderate, but for higher grade goods, tans, navy blue, red and wine shades are dyed with diazotiz-

able colors and sulphur colors.

Goods made of mercerized cotton can be dyed with the different groups of cotton colors mentioned above. Mercerized cotton has a greater affinity to dyestuffs than ordinary cotton, consequently it takes less dyestuff and less salt to dye the same. On account of its greater affinity, it is necessary to exercise a little more care in dyeing mercerized goods, especially in adding the salt only after the goods have been in the dye liquor for some time and after the larger part of the dyestuff has been taken up by the cotton. An addition of soap, phosphate of soda and sal soda facilitates the obtaining of level shades.

Silk hose is best dyed with diazotizable colors; some direct colors will be found satisfactory, too, but only those of superior fastness to washing should be selected. Diazotizable colors will produce splendid results on silk hose of all shades, as their fastness to washing is far better than anything that could be produced with ordinary acid colors. Woolen stockings can be dyed with fast acid colors; that is, colors that are fast to scouring or washing. Union hose, a mixture of wool and cotton, is dyed with diazotizable colors, and in many cases, especially for blacks, cross-dyed with a fast acid color.

The report of Secretary-Treasurer C. B. Carter was in part as follows:

What was originally deemed a very essential element of association work, was that of the formation and operation of what was termed sub-association, the subsidiary branches being composed of manufacturers making the same class of goods. Quite a large amount of the secretary-treasurer's time during the past year has been devoted to efforts to bring about a better understanding and a closer affiliation among manufacturers, but it is to be regretted that success has not followed our efforts as has been supposed, or as should be expected. Possibly the demoralized conditions confronting knitting manufacturers in the distribution of their production has been largely responsible for the failure of these plans.

Some manufacturers were of the opinion that in absence of orders for immediate or future delivery, they should either curtail their production or close down their plants. Others felt that it was essential that their plants be kept intact even though it was necessary to secure business upon an unprofitable basis, while others were convinced that it was to their advantage to run their plants full, accumulating stock to supply the demand when the market opened.

The first class of manufacturers could not see their way clear to do business except on a profitable basis, and the wisdom of such action is very apparent and it would be good policy for others to pursue the same plan. The second class of manufacturers were perhaps right in a measure, provided the period of depression was of short duration, otherwise their operating capital would be absorbed and they would face bankruptcy.

The third class of manufacturers would succeed if they had ample capital or could borrow sufficient money to tide them over until a healthy market materialized, provided that in the meantime cut prices made by the second class of manufacturers had not reduced the market to an unprofitable basis. The general impression seems to be that when business is brisk and orders plentiful, the functions of sub-association may be successfully exerted, but in periods of depression it is absolutely impossible to accomplish the measure of success necessary for the continuance of these sub-divisions of the industry.

The question of uniform color boxes for knit goods was discussed to some extent at our last convention and naturally had received the attention of manufacturers generally for a good many years past. The manufacturers are not the only ones who realize the unsatisfactory and expensive details in connection with this branch of our business. The boxmakers themselves concede that it is an abuse that should be corrected and feel that it is within the province of the manufacturer to accomplish the needed reforms.

Our members' attention has doubtless been brought to the interesting article published in the October issue of the Bulletin by Charles J. Beck, of the Charles Beck Co., who are large dealers in not only box machinery, but also of box material. The article is not very long and we feel that the subject matter is of sufficient interest for your consideration at this time, at least some of the salient points brought out by Mr. Beck.

Owing to the fact that the margins of profit in the manufacture of hosiery, underwear and other knit goods seems to be diminishing, it behooves the manufacturer to carefully guard every avenue of expense or of operation entailing added labor or material. It is unnecessary for us to elaborate on the merits or demerits of this proposition. There are some manufacturers who consider that their ability to supply on short notice any color or size box is a valuable asset for their own particular advantage, and doubtless would not entertain a proposition to simplify this feature of their business.

There are other manufacturers who are "on the fence," who would welcome a practical and well-directed plan for alleviating themselves of this burden. There are other manufacturers who are bitterly opposed to granting the buyers' demands for special packing, and it lies largely with this last class of manufacturers to supply, as it were, the sinews of war to those not fully convinced as to eliminating this expense and trouble. Just what plan may be devised, and how the same should be operated, is a question that should be fully discussed at this convention, and the members should cheerfully voice their sentiments as to their views on this important subject.

Regardless of statements to the contrary, as some yarn salesmen and spinners are endeavoring to impress upon the knitting manufacturers, the net weight yarn movement is progressing very satisfactorily. While we do not claim that every knitter is receiving, or even asking for "net weight" terms, yet the number of manufacturers who are not only insisting upon purchasing on this basis, but are securing all their requirements on these terms, is constantly increasing. There's a reason why, and if those knitters who do not keep accurate records of every case of yarn received

would adopt some plan of this character, they would soon realize the benefits of "net weight" terms.

It must be remembered, however, that the spinners have fully realized the justice of our claims, and while they may not be actually selling upon the terms desired, yet they are getting better value than ever before—that is, the tare is nearer 2 per cent. Many of the yarn representatives who are not selling net weight freely confess that the agitation has forced the spinners to cut down the tare. This movement, for which the association should receive full credit, has been the means of saving the knitting manufacturers thousands of dollars. A conservative estimate would be such a large figure that we fear some of our members might make insinuations and result in too many inquiries as to where they could secure the same brand.

On the third day of the meeting officers were elected for the coming year as follows:

President, Garnett Andrews, treasurer of the Richmond Hosiery Mills, Rossville, Ga., and the Chattanooga Knitting Mills, East Chattanooga, Tenn.; first vice-president, Charles E. Leippe, of the Reading Knitting Mills, Reading, Pa.; secretary-treasurer, C. B. Carter, Philadelphia.

Executive Committee: Robert C. Blood, John Blood & Co., Philadelphia; J. D. Berger, Berger Bros., Schuylkill Haven, Pa.; J. Ogden Wells, Cooper, Wells & Co., St. Joseph, Mich.; W. F. Carr, Durham (N. C.) Hosiery Mills; Joseph Feldenheimer, Roxford Knitting Co., Philadelphia; W. Park Moore, Brown Knitting Co., Philadelphia.

Mr. Andrews, the newly elected president, made a brief address in which he called attention to the importance of tariff revision and the high cost of living, stating that these questions should receive the careful attention of the Association, and that a campaign of education should be carried on in order that the general public might be informed in regard to the real issues. Following President Andrews' address the report of the Committee on Resolutions was presented and discussed and the following resolution adopted:

We, the Hosiery and Underwear Manufacturers of America, this day in convention assembled to the American consumers of hosiery and underwear greeting.

Whereas, The American Hosiery and Underwear Manufacturers before the adoption of the Payne schedule on hosiery and underwear asserted that no change upward in price of American hosiery and underwear to the consumer would occur as a result of such adoptions. We wish to call your attention to the fact that this promise has been kept with strict integrity, and, although cotton, through the failure of crop for the year 1909, has been increased 50 per cent. in price, the products of the American Hosiery and Underwear Manufacturers can be bought cheaper by the consumer, considering cost of labor and materials, than the same goods could have been purchased prior to said enactment, and

Whereas, All the prophecies to the contrary by those ignorant of business methods, whether by Congressmen, Senators, editors, cartoonists, correspondents or importers, have, without exception, failed in fulfillment, and whereas, these same selfwise critics, many of whom inspired the Wilson bill that caused such havoc to American industries by a radical revision downward, criticise relentlessly the framers of the Payne bill for their conservative policy of revision downward, which heretofore has never been a success.

In view of these facts we herein endorse Senators Payne and Aldrich—men conspicuous in opposition to the impotent Wilson bill and in favoring the Dingley bill that restored our nation to prosperity—as most fitted and conservative men for the task of revising downward, which as yet is but a questionable policy, as the balance of trade has been already thrown heavily against us as a result of downward revision, and we request that as this is a compromise revision that all of those interested will withhold their judgment on this enactment until the changes have time to work out, either for good or evil, and will take no heed to the rubbish of literature being constantly circulated through political inconsistencies or otherwise which is calculated to distort the mind and conscience of the American people.

The policy of protection that has made America the greatest manufacturing country in the world has been largely responsible for the increased consumption of the products of the farm and the creation of the vast army of middlemen who stand between the producer and the consumer, which included the magazines who extract many millions of dollars yearly from American manufacturers to bring their products before the consumer through their advertising columns. We are for the policy of protection that has given our country a greatness of which we all share.

During the discussion the following letter from Senator Penrose was read:

Dear Mr. Simons: I regret that I shall be unable to attend the banquet of the National Hosiery and Underwear Association on tomorrow (Thursday) night. I am suffering from the results of an acute attack of grip, from which I have never fully recovered. I had looked forward with much satisfaction to attending some of your sessions, also the banquet and having the opportunity to meet the members of your association. I cannot too strongly commend the work of your association for its activities in the past. We all recall the long and often doubtful struggle waged during the extra session of the present Congress in behalf of the present hosiery schedule. Apparently the agitation, instead of being quieted by the passage of the tariff law, is still being kept up by those interested in doing so, and it is, therefore,

evident that if your association desires to retain what they have achieved with so much effort they will have to continue their activities in the future. Active political work and vigilance all along the line should be your watchword, if the protective principle is to be maintained throughout the country. With best greetings for your members, I am.

Yours sincerely,

Boies Penrose.

At the banquet on Thursday evening speeches were made by Congressman W. W. Foulkrod, Joseph S. Rambo, C. H. Brown and ex-President Simons. Letters of regret on their inability to be present were read by Congressmen Payne and Fordney.

The exhibition of knitting machinery and supplies which was held in Horticultural Hall was well attended and proved to be a valuable auxiliary to the Convention. The schedule was arranged so that the Exhibition did not open until after the adjournment of the Association meetings so that there was no conflict between the two.

The Ballard Electric Cutter, shown by H. Maimin, sole agent, Bourse Bldg., Philadelphia, in Booth 78, was one of the interesting exhibits of the Convention and was continuously attended by large numbers of visiting underwear and sweater manufacturers. Mr. Maimin, who took personal charge of the exhibit, in conjunction with his son and Mr. Fabian, is well known to the knitting trade, and had no trouble in convincing the manufacturers that this cutter could save them money and proved their arguments by showing pictures of the cutting room in one of the largest underwear mills in Pennsylvania, in which they recently installed the Ballard cutter, the one machine displacing 20 out of 30 girls, permitting the company to use them in other departments and enabling them to save from $2,000 to $10,000 per year.

Roessler & Hasslacher Chemical Co., whose business concerns one of the most vital questions of interest to knit goods manufacturers, namely, a good bleach, were located in space 87. They understand this business both from the scientific and practical standpoint, and their staff of experts are familiar with the problems which concern knit goods manufacturers, and are competent and willing at all times to visit the plant and give advice and directions on the spot.

Harding & Fancourt, Incorporated, Germantown Ave. and 2d St., Philadelphia, whose interesting exhibit at the last convention will be remembered, are again exhibiting this year, as they found that knit goods manufacturers were interested in their special products for softening and finishing. Their Tuscan softener is widely used for fast black dyeing and for finishing. German castor oil soap, which is two to three times stronger than 75 per cent. Turkey red oil, is another of their products which is used in the boiling out of cotton to prevent discoloration, and neutralizing any free lime or iron that may be in the water. Soldine is a soluble oil which is used in a dye bath, which saves the necessity of boiling out cotton before dyeing. Besides these specialties and others, they are manufacturing all grades of Turkey red oil, direct importers of olive oil and foot-sodas, and are making a specialty of pure green olive oil soap and other mill soaps.

The Nicetown Dye Works, Westmoreland and C Sts., Philadelphia, were prominently located on the main floor, where their representative, Mr. Anderson, demonstrated by showing samples and telling why "Hagars" dyeing of hosiery saved darning and wore longer than some of the other dyes on the market.

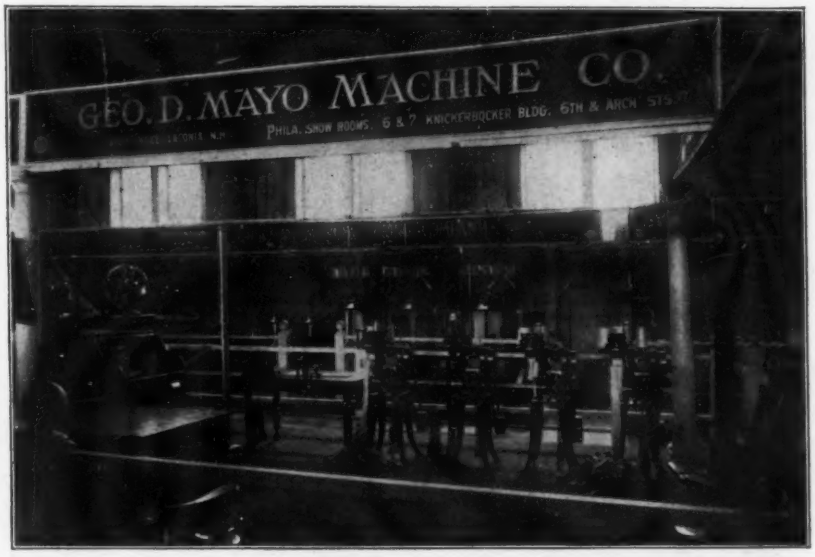
Nonotuck Silk Co., Philadelphia, had an attractive exhibition of silk in all forms for the use of the knitting trade in charge of Edw. B. Gorman.

The Berlin Aniline Works occupied a space which no visitor could get by without receiving a friendly greeting from their attendants who showed various products of the textile trade dyed with their colors.

The Kaumagraph Co., 156 Fifth Ave., New York, manufacturers of trade marks stamps for textile fabrics and designs for embroidering stamping, gave a practical demonstration in their space showing how

their process works and how the trade marks are applied to various lines of goods.

The Hemphill Mfg. Co., of Pawtucket, R. I., exhibited four of their latest improved



GEO. D. MAYO MACHINE CO.

They find that textile manufacturers, and particularly knit goods manufacturers, are more than ever employing their method and old conservative concerns that have been

"Banner" machines in operation, so that manufacturers could see for themselves the improved features which have been so favorably commented upon.

GROSSER KNITTING MACHINE CO.

hitherto unwilling to depart from their former methods are now using the Kaumagraph process.

The Geo. D. Mayo Machine Co., of Laconia, N. H., in a space fitted up in an attractive manner, entertained their friends

machines for sweater work, a "Diamond" seamer, an "Ideal" seamer, and an "S. C." overseamer for regular goods. They also equipped a power sewing machine table with six "Record" loopers of the latest style. Mr. Max Nydegger personally superintended the exhibit, assisted by a competent staff, who explained the different machines to interested parties.

THE WILCOMB MACHINE CO.

The Merrow Machine Co., of Hartford, Conn., in Space 96, had in operation a full line of their overseaming and shell stitch machines, in charge of E. H. Allen of their Philadelphia office, assisted by P. J. Smith. Their style 60 machine is a wonder for welting tops of ladies' hosiery, the same machine doing the shaping equally well. The finish from their shell stitch machine is very popular and is being used extensively on a good class of ladies' ribbed vests and combination suits. Mr. Allen welcomed his old friends and was always ready to show interested parties the many advantages to be obtained by using the Merrow machines.

Smith, Drum & Co., Coral and Cumberland Sts., Philadelphia, builders of machines for dyeing, singeing and finishing hosiery, and mercerizing machines, occupied a space on the first floor of the Exhibition Hall, showing a line of machinery which is now in much demand by the knitting trade.

The Wildman Mfg. Co. exhibited for the benefit of their customers, and others visiting the Convention, various sizes and styles of their circular ribbed underwear machin-

ery; also demonstrated their chainless automatic hosiery ribbers with attachments for selvage welt stripper and two-speed drive. Mr. F. B. Wildman and D. C. Bellis had charge of the exhibit.

The Acme Knitting Machine & Needle Co., of Franklin, N. H., exhibited the merits of the latest type of Acme seamless hosiery knitting machine. The recent improvements in the Acme have already been described in a previous issue. This machine meets the requirements of manufacturers from the coarsest to the finest grades of hosiery and covers the widest range in the variety of work.

The Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, had quite a large exhibition of the machinery they produce. The space they occupied, while inadequate to show the large line of machinery they build for the knitting trade, was fitted up with one of their latest improved Hurricane stocking dryers.

The Southern Textile Machinery Co., Heed Bldg., Twelfth and Filbert Sts., Philadelphia, equipped their space with their new steady dial movement looping machine for all classes of knit goods. Many orders have been received, and Mr. Davis, the inventor, was kept busy explaining the merits of the machine to the different manufacturers.

WILLCOX & GIBBS SEWING MACHINE CO.—W. T. LANE & BRO.

The Beckert Needle & Supply Co., Germantown, Philadelphia, as usual fitted up their booth for the reception and use of visitors.

The Carl Schlatter Dye Works fitted up their space with samples of fabrics and yarns dyed in their establishment at Ontario and Hartville and Rorer Sts., with an attendant on hand to entertain their visitors and explain the merits of their work.

Charles Bond, mill supplies, 520 Arch St., Philadelphia, equipped his booth with belting, pulleys, hangers, etc., and a line of transmission machinery suitable for the knitting trade.

Harding, Tilton & Co., at the top of the stairs, made a great exhibition of the lines of yarns they are selling.

work. Mr. Jacob Bauer, the general manager of the company, together with Charles Schoneman and P. R. Rahn, were on hand in their space to give any information desired by those looking at the machines.

Wilcomb Machine Co. had the most prominent exhibit in the exhibition, as they had the stage of the large hall raised several

THE HEMPHILL MFG. CO.

The United States Truck & Supply Co., Land Title Bldg., Philadelphia, showed a line of trucks suitable for use in textile mills.

The exhibit of the Standard Machine Co., 12th and Callowhill Sts., Philadelphia, consisted of three of the latest improved standard "F" type of machines which they are now building, all of which were in operation. The display consisted of a machine running on misses' ribs for cotton, the footer being for 176 needle goods and 3 1/2 inches in diameter, transferring to a rib top consisting of 352 needles; a 200 needle, 3 3/4 machine, on half hose and also a 220 needle machine, 3 3/4 machine, running on ladies' string

feet above the floor. On the stage were two of their machines against a background of woven tapestries. Above the exhibit in red electric lights, a large sign of the Wilcomb Machine Co. illuminated the whole hall. The machine adapted for underwear, balbriggan, rubber linings, stockinette, etc., with a diameter up to 24 inches, gauges up to 24 needles per inch, 6 to 16 feeds, great production, simple and with low operating cost, and the machine wholly self-contained, attracted great attention. The exhibit was in charge of Victor Mauck, president and general manager; Herbert S. Mauck, treasurer, and J. Frank Wilcomb, vice-president of the company.

The New Bedford Textile School, in Booth 75, showed a full line of hosiery in all

Scott & Williams of Philadelphia exhibited one 15 inch knitting machine cut 14 needles

THE PHILADELPHIA DRYING MACHINE CO.

colors in mercerized and lisles and underwear. They also showed goods from raw stock to finished product, all work done by

to the inch equipped for making Richelieu 2 by 2 fabrics which compares favorably with any imported fabric of the same kind. On

UNIVERSAL WINDING CO.

and prospective users of their machines by showing them an exhibit of four machines of the latest improved type for the making of several different kinds of hosiery.

this machine they used 1/50 yarn to produce the fabric. Another machine exhibited by this concern was a full automatic shirt machine cut 12 needles to the inch using 1/26

yarn and producing a shaped ladies' garment and by a simple moving chain mechanism. This machine can be made to make a 3/4

THE JENCKES KNITTING MACHINE CO.

union suit or regular union suit for ladies. They had also on exhibition another machine which created considerable attention from the hosiery trade in the way of a 1/2 hose knitter.

STANDARD MACHINE CO.

The Ainslie Knitting Machine Co. of Brooklyn, N. Y., exhibited two of their latest improved flat knitting machines, one for the manufacture of neckties or sweaters and the other for silk neckties in transparent patterns. These machines being the only flat necktie machines in the exhibition they created considerable attention.

The Oswald Lever Co., Philadelphia, well known as builders of winding machinery for

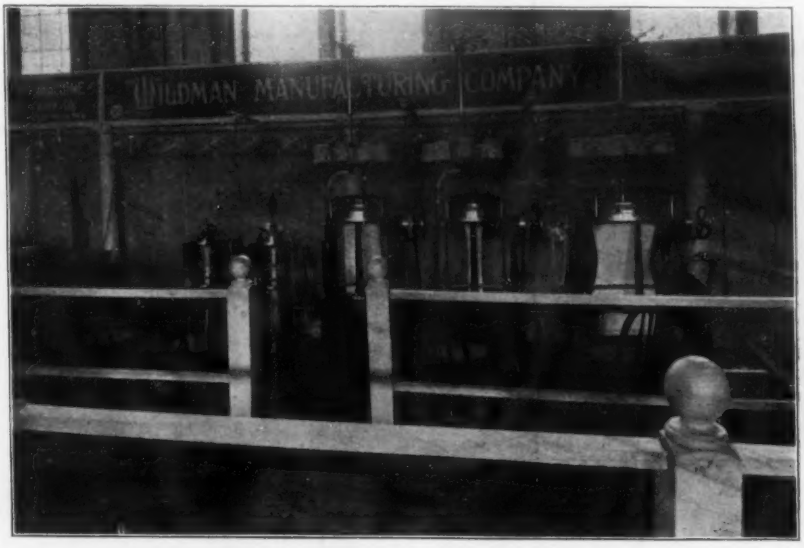
THE H. BRINTON CO.

use in all kinds of textile mills, exhibited one of their latest improved hosiery skein winders with a variable motion, which kept their representative busy showing off its merits to the visiting knitters.

ACME KNITTING MACHINE & NEEDLE CO.

Something new in the way of stamps was shown by the Wholefoot Hosiery Stamp Co.,

1324 N. Lawrence St., Philadelphia. This patent interchangeable expansion stamp



WILDMAN MANUFACTURING CO.

permits a manufacturer to use three distinct stamps on a stocking in one operation.

The New Jersey wire stitcher, which was recently described in a previous issue, was exhibited by J. L. Shoemaker & Co., 15 So. 6th St., Philadelphia. They showed the rapid and simple manner in which it attached labels to hosiery and other garments.

Louis Hirsch, 260-62 W. Broadway, New York, representing H. Alban Ludwig, of Chemnitz, Germany, builder of full fashion machines, was prominently located on the first floor of the hall where he entertained his visitors in an attractively furnished booth.

The Sorosis Silk Co. of Allentown, Pa., showed their line of silk yarns in trams, organzines and floss on cones both dyed and in the grey.

The Chas. Beck Co., 609 Chestnut St., Philadelphia, well known to the knitting trade, exhibited a patent staple wire stitcher, cutting machines for the underwear trade and other machinery for which they have recently been receiving many calls.

The E. Jenckes Mfg. Co., Pawtucket, R. I., showed a full line of their famous knitters consisting of a 220 needle 3 3/4 inch diameter machine with a yarn changing and garter top attachment, changing the yarn completely in the garter top and heel and toe.

SCOTT & WILLIAMS.

Another machine exhibited by them is a 240 needle 3 3/4 inch diameter with a garter top

and high spliced heel and double sole attachment, also a machine known as a 234 needle 3 1/2 inch in diameter with a reinforcing attachment adapted for handling linen, mercerized lisle or splicing yarn of any description.

cone spools and which they claim needs no rewinding, contains no knots and makes no waste.

The C. E. Hardenbrook Co., 44 N. 4th St., Philadelphia, demonstrated the advan-

SMITH, DRUM & CO.

H. Brinton Co., 213 Race St., Philadelphia, displayed in an attractive manner the machines built by this concern, consisting of single feed automatic ribber with a two-speed attachment and detachable welt for making half hose tops. This machine contains all the features of the old Brinton ribber with new improvements for increasing the production of the machine from 30 to 60 per cent., according to the class of work being made. Another machine shown by them was their regular single feed automatic ribber. As a final novelty in their exhibition they showed what they called their Universal necktie machine used for making knitted scarfs capable of turning out at least 40 different patterns and which is now being used by all the knitted neckwear manufacturers in the country. They have just issued a new catalogue showing all of their designs of machines which can be obtained on application.

Richard A. Blythe, Inc., 300 Chestnut St., Philadelphia, selling agent for the Lehigh Valley Silk Mills, in demonstrating the line of silks produced by them for use in knitting mills, had in operation a knitting machine supplied by the Mayo Machine Co., of Laconia, N. H., on which they manufactured rib tops of silk, the silk being wound on silk

tages of the new union single thread button sewing machine.

The Continental Latch Needle Co., 120-22 Liberty St., New York, were represented at the show by Mr. Jasper, who was kept busy

LOWELL MACHINE SHOP.

showing their line of German needles to those inquiring for goods of this kind.

The Grosser Machine Co., of 260 West Broadway, New York City, had a large space in which they showed a number of knitting machines and auxiliary machines,

operated by Philadelphia mill hands. Among these machines were four automatic knitting students. The exhibit was in charge of C. H. Porter, whose paper before the Convention was heard with great interest. Mr. Porter has demonstrated that all branches of knitting can be thoroughly taught in a textile school and in some of the knitted fabrics on

H. MAIMIN; BALLARD CUTTER.

exhibition, made in the school, Mr. Porter has demonstrated that the school is the place for research work and for the development of new ideas for furthering the industry.

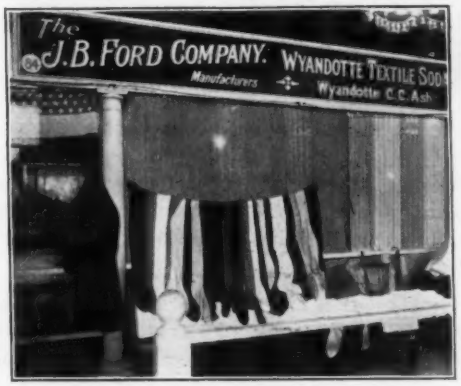
Wilcox & Gibbs Sewing Machine Co., of New York, showed their "overlock" seaming and "Overlock" hemming machines, lock stitch and finishing machines, a hosiery trimmer seaming machine, "Overlock" felling machine; also exhibiting a single independent hosiery table with ball-bearing transmitter with independent electric motor drive. These can be run wherever electric light is available. The exhibit was in charge of N. S. Kellog.

The Manufacturers Supplies Co., on the ground floor facing the main entrance to the exhibition, showed a line of various supplies and needles for use in knitting mills.

Western Electric Co., with branches in different sections of the country, exhibited motors and other electric appliances suitable for use in knitting mills, which included fans, controllers, and a complete line of electric lamps for lighting purposes.

THE ROESSLER & HASSLACHER CHEMICAL CO.

The Universal Winding Co. occupied Spaces 73 and 74, in which they had installed their different machines all in operation and under the charge of Messrs. Quinn and Porter, who were continuously receiving their patrons and handing out samples of the work.



THE J. B. FORD CO.

Andrekovicz & Dunk, Front and Arch Sts., Philadelphia, one of the new exhibitors at the Exhibition, occupied a tastefully arranged booth where Mr. Bertolet was kept busy showing hosiery in different colors dyed with their colors, turkey red and olive oils and green olive oil soap.

The J. B. Ford Co., Wyandotte, Mich.,

with Messrs. Reynolds and Nicholson in charge, showed the fine results obtained by the use of "Wyandotte" soda for washing purposes, the textile assistant in bleaching, and other Ford products which are so successfully used by the textile trade.

W. T. Lane & Bro., Poughkeepsie, N. Y., showed their line of famous "Lane" canvas

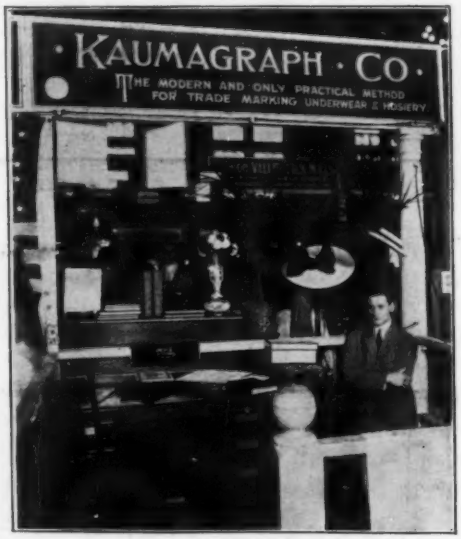
BERLIN ANILINE WORKS.

baskets constructed with spring steel and making them practically indestructible. The exhibit contained baskets of all kinds and for all uses.

One of the visitors at the Knit Goods Convention who took an attractive interest in meeting their many customers in this vicinity may be mentioned "Buckeye" Conley of the Buckeye Electric Co., Cleveland, Ohio, experts in mill lighting, etc. Mr. Conley aroused much interest when he told how he could save them money and give a better light by using the latest Buckeye Mazda Lamp.

The Rex Dyeing & Finishing Co., Willard St. and Frankford Ave., Philadelphia, showed an up-to-date line of popular shades and blacks on hosiery. This concern is acquainting the hosiery manufacturers with their new aniline (oxydized) blacks, which does not tender or weaken the fabric in the least. The brilliancy of the shade, feel, finish and elasticity of this black is unequaled. Messrs. Adolph and Fred Scholler were in charge of the exhibit.

The exhibit of the Union Button Sewing Co., Boston, Mass., which was on the right of the main entrance, created a great deal of attention and their new union elastic stitch button sewing machine maintained its reputation there. The exhibition resulted in the booking of many orders for this machine and the managers were more than pleased with the results.



THE KAUMAGRAPH CO.

Henry L. Scott & Co. of Providence, R. I., who had an exhibit on the main floor, center aisle, were busy during the entire exhibition. Their exhibit consisted of power and hand yarn and cloth testers, roving reels, twist counters, yarn inspectors, reels, scales, etc. These machines are becoming not only widely but favorably known to the trade, and the exhibition week made for them many new customers.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

PLAIN VELVETS.

BY GAUL.

(Continued from May.)

Weaving with three picks for each wire can be accomplished in only the four ways shown at A, B, C and D, Fig. 13. The weave drafts for these four methods are shown at a, b, c and d. The pile warp can be woven as shown at a′, a″ and b′, Fig. 13, but these are simply reproductions of a and b. In practice the weaves shown at A and D, Fig. 13, are usually employed, the first one giving a full, lofty pile, while the one shown at D gives a more solid pile. The section, A, presents an iron bed on two picks, while in D there is an iron knot. In the last weave the plain stitching of the pile thread on three picks holds the pile firmly and prevents it being easily pulled out of the fabric. The weave, F, Fig. 13, shows an application of the section, A. The two ground threads between consecutive pile threads are woven plain, which necessitates a repetition of two wires to complete the pattern. The weave, G, differs from the preceding weave only by the stitching of the ground thread. This is adapted for high grade goods and is used in the manufacture of Berlin velvet. The draft, H, is similar to the preceding weave, the intersections of the ground threads being shown plainly at E, while the pile is shown at D. This weave is extensively used, and in silk it forms the Crefeld velvet; in wool it is called Panne velvet. As the manufacture of Panne velvet is of considerable importance, we will give some details regarding this fabric.

Usually Panne velvet is made with the weave, H′, Fig. 13, which corresponds with the draft, H. In the draft, H′ the pile works opposite to the adjacent thread at the right, consequently the pile thread remains in position when the wire is drawn from left to right.

A fabric called Panne filature is used for covering rollers of spinning machines, warpers, etc. It is usually colored green. Following is the construction:

Width in the reed, 19 inches, 48 threads per inch, ground warp single 30s linen, pile warp single 18s worsted. Filling, single 25s worsted, 15 wires to the inch. In the cheap grades the ground warp and filling are cotton. The Panne Sellerie velvet is used in the manufacture of harness for carriage seats and similar purposes, but in recent years has been used but very little.

The livery Panne, as its name indicates, is used for clothing domestic servants. The pile is mohair. Panne velvet for upholstery purposes is usually made with a ground work of cotton, the pile being linen, mohair or jute. Following are a few fabrics in general use:

1. Width in the reed, 53 inches, 1,145 dents with 3 threads in a dent. Ground warp 2,284 ends, 2/24s cotton. Pile warp, 1,100 ends bleached 2/30s linen. Filling, single 16s cotton. Height of wires, 1/12 inch, 26 wires to the inch.

2. Panne velvet for printing (table covers, etc.). Reed, 1,420 dents in 63 inches, 3 threads in a dent. Ground warp, 1,440 ends, 2/18s cotton. Pile warp, 700 ends bleached 2/30s linen. Filling, bleached single 6s linen. Height of wire, 1/12 inch, 20 wires to the inch.

3. Jute plush. Reed, 1,100 ends in 53 inches, 3 threads to the dent. Ground warp, 1,150 ends 2/16s cotton. Pile warp, 540 ends of 2/12s jute. Filling, single 6s cotton. Height of wire, 1/12 inch, 20 wires to the inch. These goods are usually made in pieces of 40 to 45 yards.

There is a velvet called Panne houppe which requires a wire 5/8 inch in height. The ground warp is single 30s cotton; the pile warp is bleached single 8s to 10s worsted. Great care must be exercised in the manufacture of this fabric owing to the height of the pile. It cannot be wound on a roller and usually is left to fall directly into

a box placed under the loom. By referring to Fig. 13, the velvet will be seen at I, having two pile threads in a pattern. One weave is shown at section A, the other is shown at section D. Three harness are required, one for the ground and two for the pile threads. In weave, N, Fig. 13, the pile threads are woven as shown at D. This velvet constitutes the velours croise uni of Lyons. As the ground weave is irregular, we show the development at K, L and M. At K it is a 4-leaf serge twill. There are 3 picks for each wire. The pick coming after each wire is the same as the one that precedes, as shown at L. At M the weave, L, is shown with the wires. It is possible to weave the pile warp in a different manner for each wire. Thus the weave, P, shows the pile threads working alternately in accordance with sections B and D on a ground, E. The weave, O, comprising four pile threads working in different ways, is but a curiosity, as the mounting of the loom for such a fabric is very complicated.

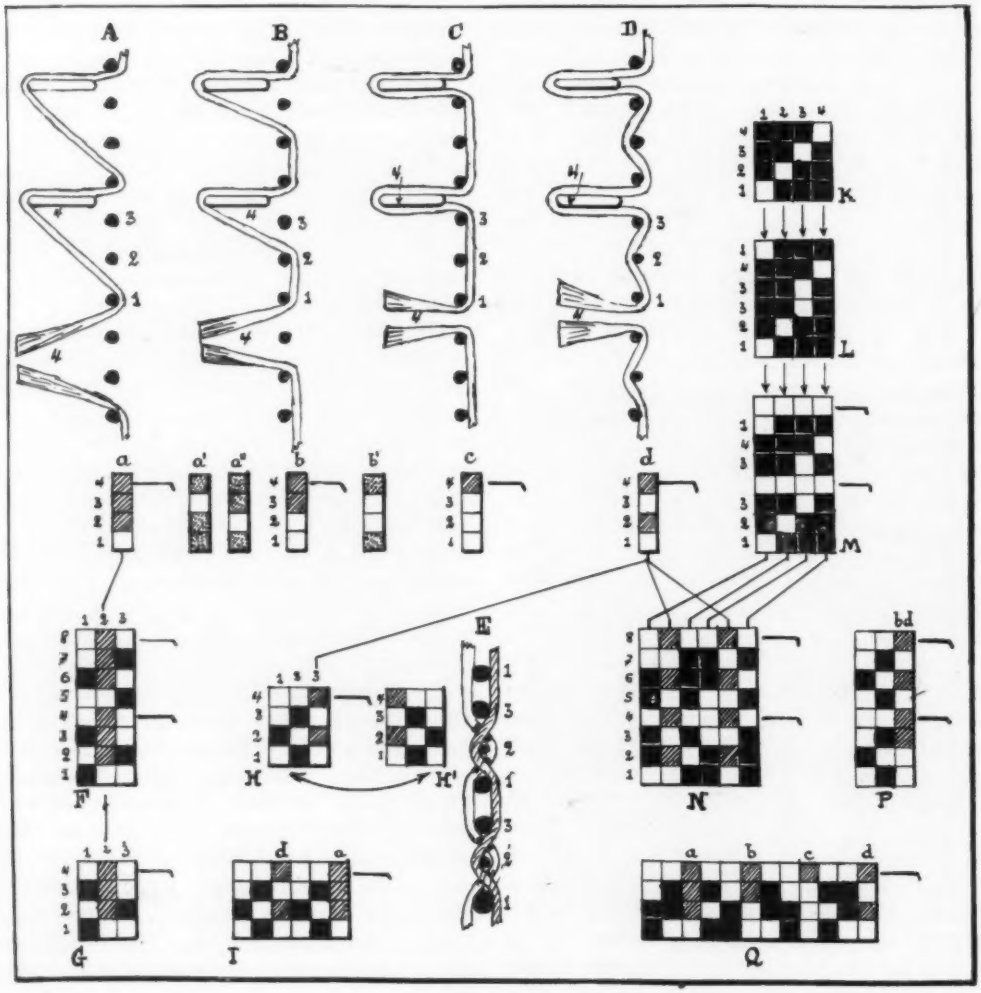


FIG. 13.

(To be continued.)

AMERICAN RAGS IN THE ENGLISH MARKET.

(By Our Special Correspondent.)

Evidently a lively interest is being taken in the English market for American rags. A receiver of consignments tells me that hardly a week passes without bringing forth some new communication from rag graders in the United States. Several graders, I find, have been over here and I have seen today in Dewsbury some hundreds of tons of American rags. Every steamer is bringing some, says one who transacts a large part of the American business. It was with no surprise, therefore, that rag dealers in Dewsbury read the letter sent by the editor of the Textile World Record notifying me that an American rag merchant desired to enter this export business and purposed to visit Yorkshire shortly. I was to describe for his benefit, and that of others, the methods of doing business and the class of stock in demand, adding anything likely to be useful in the way of casual information.

Probably nobody needs telling that the world market for woolen rags is Dewsbury or that Dewsbury is in Yorkshire and that Dewsbury with its twin sister, Batley, forms the heart of the English heavy woolen manufacturing trade. Alighting at Dewsbury, pressing past the few shps in the center, one sees at once that he is in rag land. Everywhere are the warehouse signs of rag dealers, mungo merchants, hair importers and shoddy manufacturers. Every second or third cart on the road carries bales of rags. As Dewsbury devours a thousand tons a week of foreign rags and a similar quantity of domestic, the presence of scores of dealers stands explained. The inquiring dealer asks for a directory of Dewsbury rag merchants. There is no directory of them separate from large and expensive volumes dealing with many other trades. Probably the book would not be of real use to him if it existed. Naturally, in a business of this kind there are many small dealers.

The inquirer asks whether there is a rag exchange. The answer is in the negative. Instead of an exchange Dewsbury has auctions held by various auctioneering firms. The oldest is that of Henry Cullingworth & Sons, who were in at the beginning of the trade in 1845. One of their recent catalogues accompanies this article, and shows that in one auction there were 477 and in the next 600 lots. The places of origin of the lots are English, Scotch, German, French, Dutch, Belgian, Norwegian, Danish, Italian, Australian and American. I cite the prices made for some Boston rags on February 2:

"D" in Circle.

Lot.	Mungo Rags.	Per 112 lbs.
502	2 bales Super Black	£0/13/—
504	4 bales Super Brown	£0/15/—
505	38 bales Super Black Worsted	£1/ 8/6
505a	26 bales Blue Worsted	£1/ 3/6
505b	2 bales Green	£1/16/—

Robert Thornton & Sons, Dewsbury, gave me the evidence of invoices in proof of their large transaction in American rags, showing for which American graders they are already selling F. W. Reuss & Co. and B. Eastwood and nephew are auctioneers with good clientiles. Mr. Reuss possesses exceptional knowledge of the trade and is the respected mayor of Dewsbury. Any of these firms would be pleased to treat with reliable consignors. The auctioneer's terms are 2 1/2 per cent. commission with two pence per cwt. (4c. per 112 pounds) porterage. They are responsible for payments and pay cash in ten days, subject to any advances made against shipping documents.

I asked an auctioneer why an American grader should deal with auctioneers rather than with merchants who would make an out and out price. He answered: "For the sake of competition and good prices. We bring the buyers together and make the market. Even the merchants who are supposed to buy direct buy most of their stock in the auctions." I asked whether he recommended senders to consign under a reserve price or for absolute sale. He replied that many of their principal clients took the risk of the market; that the auctioneers in pleasing the client were acting best also for themselves. He explained that in the event of a reserved price they did not let the goods go for less without permission, although in the event of one lot fetching more than the reserve they

would feel justified in selling the next lot of similar size at a price as far below the limit as the other was above it, unless better could be done. He added that the auctioneer arranged the best terms with the railways for transport and storage. The answer to objections against the auction system is that it goes on and that the same firms for generations keep on consigning.

Mr. Cullingford reports that the market is overcrowded with new linseys from America. New clippings from your tailoring factories are "sticking" and difficult to sell. He and Mr. Thornton agree that the American sorts wanted are dark skirted and blue skirted worsteds, black, blue and brown skirted carded woolen cloth, green billiard goods and black, blue and green dress serges and good fancy knits. Dewsbury has a word of its own for these factory clothiers' clippings. When they are not said to be "nowt," they are called "all shoppery" and I have other testimony both old and new to the fact that they are not much fancied. Two merchants assert that large quantities have had to be sold at half the reserve price and piles of bales of them were pointed at as material with which the holder did not know what to do. This account of the requirements is advise that there is no room to doubt. Dewsbury prefers rags of some quality.

The trade in American rags that is now so considerable is a development of the last two years. The exact extent cannot be seen from British import statistics as the American tonnage is included in "All other countries." I repeat two opinions about the trade substantially in the terms used by men who should speak with an equal authority. "American rags" says an auctioneer, "are a little inferior, but they are cheaper comparatively than domestic supplies. Manufacturers have got into the way of using them and want them. What they have to fear is that the carded woolen business will improve so much in America that none will be spared for export. American rag dealers keep writing that trade is better in their country, but the rags still come. Users are protecting themselves by reserve stocks. I have between 800 and 900 tons bought and paid for by one customer which I am keeping for him in store now." Thus a seller speaks.

Take next the version given by a buyer who is one of the largest merchants of rags. He began by laughing at the notion that Dewsbury wanted American rags or had any use for them if they came. It is true that he had plenty of them in the warehouse and that the merriment might arise from a not unpardonable desire to buy cheap. But according to this authority there is a defect in American rags that affectually discounts their utility. This is the peculiar harshness ("haskness" in Yorkhire) that is imparted by the American finish. Counterbalancing any desirability that might seem to be lent by uniformity of color or length of "tear" this fatal hardness disposes the merchant to bid only a low price for what would otherwise seem a good sample. The individual in question was opposed on principle to giving information away. He believed that a man who knew what he had bought goods for knew at what price he could afford to sell them again. If anybody in America was inclined to submit samples he was ready to mark his personal opinion by buying or not buying. This attitude is the one the seller may confidently expect when he comes to confront the hard-headed Dewsbury merchant.

I asked another merchant to state the case for the direct buyer as against the auctioneer. He pointed out one material difference. The auctioneer sells rags in condition as received. The merchant, who in the case is F. Wutow, Ltd., deals with them to his own liking, opening, shaking, sorting and blending them to his own standards. Wutow's occupy Michael Sheard's old mills in Batley and when it is said that their blending bins have a capacity of 1,000 tons inquiries may be helped to an understanding of the size of large rag warehouses in the Dewsbury area. In a place like this, old rags are handled in a separate warehouse from new. The bales are lifted forthwith to the top story, there to be shaken in machines and sent down shoots or carried forward on traveling sorting aprons. The sorting is done in airy, brilliantly-lit, clean,

whitewashed chambers. The girls employed are in healthier condition than in nine out of ten milliners' shops. The sight is one to put the persistent vilificators of the rag industry to the eternal blush.

If a final hint is acceptable to American sellers visiting Dewsbury let it be this: Do not, in approaching our buyer, tell the names of all the other competing buyers with whom one is dealing. I have heard of visitors announcing themselves as so-and-so of New York or Rochester or Kalamazoo, who has been grading rags for so many years, and who is already dealing with Such-and-such and This-and-t'other and What's-his-name, all of Dewsbury. Perhaps it is absurd that it should be so, but the latter reassurances have had undesired effects on some to whom competitors' names have been mentioned. A closer mouth regarding one's own affairs is more requite in England than in America. The man who is listening is not at all wishful that his name should be the next to be used as an inducement and encouragement to others.

ALPACA HAIR FOR THE UNITED STATES.

A recent report by British Vice-Consul Stafford at Arequipa, Peru, contains the following reference to the trade in the hair of the alpaca:

The principal markets for alpaca wool are the United Kingdom and the United States, but a certain quantity is consumed in Russia and Germany. Up to about six years ago the United States purchased in Liverpool all the alpaca needed, but since that date they have been trying, and with some success, to draw their supplies from Arequipa. An important firm having houses in New York, Lima and Arequipa actually has a salaried expert resident in Arequipa for the purpose of grading any alpaca purchased by them intended for the United States manufacturers, as owing to the heavy import duties it is only possible for these to receive the cream of the alpaca, the remainder having to go to Liverpool where it finds a market.

The imports of cotton yarn into China in 1907 were valued at $43,565,000.

ENGLISH NOTES.

(By Our Special Correspondent.)

The matter of five per cent. in wages which divides employers and employed in the cotton industry and is bringing Lancashire to the verge of catastrophe, is entangled with several complications. The operatives say they have made their sacrifice in the shape of short time. The employers in the Federation point out that not all the operatives have been on short hours. Union workpeople have worked full time in those North and Northeast Lancashire spinning mills which disregard the Federation and share any benefits that come without in any way contributing to the expense. Wages now are five per cent. higher than at any time previous to the cotton boom. Operatives point out that living is dearer and protest that a reduction of wages is no cure for the ills the trade is suffering from. The masters have offered to postpone the reduction until the fall. The men have answered that by that time business will almost certainly be improving. To the plea that Oldham is losing heavy sums weekly now, the answer is returned that spinners have not yet exhausted the long stocking that was filled when trade was good. Many non-federated mills act with the Federation in its main decisions and there is no quarrel with them. The parasitical competition and the countenance lent to it by the unions rankles in the Federation's memory. The chance that a total stoppage of spindles would bring down the price of cotton is balanced by the chance that the stoppage might last too long and throw a good deal of English business into foreign hands.

* * *

The complaint of an American maker of finishing machinery against English methods of business is pathetic. He greatly prefers the American style of—as he says—facing the facts. "I sell a machine," he adds, "on terms of thirty days' free trial, cheque to follow thirty days after that. What happens? The affair drifts on for months and months. The fellow finds excuse after excuse endlessly, always professing dissatisfaction, always wanting to see how it will

work on some different class of goods, never letting us see the operation, never telling us how, why, where or what is wrong. We get exasperated and ask if he wants to send the machine back. Not he. He merely does not want to say the thing is good. We tell him we want our money. Quarreling over discount begins. We refuse to knock off the shillings, but give in eventually about the pence. The creature turns and tells us he would not be without the machine if it cost twice the money! What in eternity is the explanation of that and is all your business like it?"

"Not all" is the answer. But the intelligent salesman need not work Lancashire and Yorkshire for long before finding the fondness for something-for-nothing, the deep desire to keep something hid lest it should by any chance be useful to others. The dodging is all in the game. Patience is wanted to play it and there must be firmness in bringing the player eventually to book. The annoyances are inseparable from the introduction of a novelty. They are less irritating when one comes to understand them and has the backing of a steady trade.

* * *

Hide and skin traders have joined with wool dealers in protesting to the Government against the present means of branding sheep. The generous application of hot tar and disfigurement with the hot iron are estimated to cause a loss of $500,000 a year. That is in loss of wool only and the estimate refers only to this kingdom and its 30,000,000 sheep. The Department of Agriculture is to go into the subject and the political head of the Department has agreed that eventually action will have to be taken. If the damage is half a million in England what may the bill be for the world?

* * *

Recommendations for the regulation of the sale of flannelettes are very numerous. Professor Perkin, inventor of a flame-proofing process, proposes a government inspection and the stamping of flannelettes as "proof" or "non-proof" accordingly as the fabric does or does not satisfy official tests. A coroner would have dangerous flannelettes stamped "dangerous" or "highly inflammable." There are philanthropists who would forbid the sale of the goods altogether. On the other hand there are finishers of flannelette who depose that better and better qualities are coming into customary use. Manufacturers come forward to prove by ocular demonstration that good flannelette with plenty of filling to the inch is really not more dangerous than ordinary calico. Then there are drapers to say that deaths from the burning of flannelette nightgowns are common largely because the wearing of flannelette is nearly universal. Probably 80 per cent. of children wear it. Apart from bias one way or the other it is fairly clear that the risky flannelettes are the cheapest ones made from waste, stinted of filling, irregularly raised and chemically weighted. If flannelettes are to be sold with a statutory caution what of ramie underwear, lace curtains, pinafore muslin or any light cotton goods? There is no legislation on the table as yet.

* * *

Dry-combing, cone-drawing and ring and mule worsted spinning make slow headway against the Bradford system in this country. It is in dry-combing and cone-drawing in conjunction with Bradford spinning that evident progress is made. The theory of the French system has been taught in the leading textile schools. Only now is an experimental plant being provided and the Leeds University is its venue. The demands for yarn from makers of fine suitings, the large imports of Amazon dress goods from France, the increasing business in cloths of thick counts made from fine wool and the clamor for finer shades than oiled wool will give, all assist the supposition that developments in the utilizing of short fiber for worsted will have to proceed.

* * *

Smoke prevention laws grow stiffer in this country and now any manufacturer in Bradford guilty of turning either smoke or grit from his chimney is subject to a $250 fine on

a third conviction. There are 600 mill chimneys in the city, a large proportion of them in conjunction with economizers, induction fans and mechanical stokers. The type of stoker in most general use gets the blame for the showers of sooty grits which, descending from great height, spread over a wide radius round the mill. Gutter-spouts become choked with the half-consumed particles, while cabbages grown near the mills are found to have layers of grit between all their leaves. Loud complaint is made by residents and by owners of goods spoilt by the grit showers. The sprinkling stoker which chucks small coal in small quantities into the roaring draught is the distributing agent. This type is being superseded by the coking stoker which delivers coal in solider bulk, costs $300 to $800 per boiler to install is guaranteed by numerous makers to abolish both grits and smoke and to give higher efficiency. The new by-laws give more satisfaction to furnace engineers than to the manufacturers who are forced into outlay on new plant.

We are just past the era of hand-firing and there are some who maintain that perfect hand-firing is still better than any mechanical work, but there is a great dearth of anything like perfect hand-firers. Our dyers are in the best position to appreciate steam-raising economies and one of them who uses over 600 tons of coal a month finds an economy of at least 33 per cent. in the use of modern appliances. He has four boilers fitted with sprinkler-stokers, one hand-fed fire, economizers, an induction-fan and a long chimney. His coal bill is 8 per cent. of his turnover, and without these improvements was 12 per cent. Were there constant use for it in the works he might economize more heat from his furnace gases, but under the circumstances is content to send up his products of combustion hotter than need be. His boiler is fed practically continuously with live steam and he supplies with heat and power a large finishing department. Wool dyers with no finishing departments have a coal cost of 4 to 5 per cent. The dyer who supplies the data is of opinion that more progress has been made in fuel economy of late years than in any department of his business.

* * *

South Africa is one of the few countries which can be legitimately expected to increase its wool in quality and quantity and the Government there is intent on doing its part. Not so long ago the small up-country grower got no better price for poor wool than for good. Even now he does not know the profit that the local dealer makes out of him. It is well that the authorities of the Orange State are arranging for reports on the prices obtained in Europe by the local clips. The same authorities are pressing for lower freights on pedigree stock. In the Basuto native province the herdsmen get the free use of Government Rambouillet rams.

Cape Colony, the largest of South African states, has now 18,807,000 sheep and 8,275,000 goats, or more than ever. In 1904, after the war had depleted the flocks, there were roughly seven million fewer sheep and half a million fewer goats. There is official authority for the statement that small holdings are a proved success and that the country is bound to become a great agricultural one. The South Africans are doing well with their mealies and are likely to attend still more to crops, but it is for sheep alone that much of the land is fit.

* * *

A Scottish Court made a pronouncement the other day on the use and meaning of the term "indigo-dyed." These words stamped on a piece are to be taken as warranty that the goods contain an appreciable amount of indigo, absorbed in vat-dyeing. The term has been freely misused for a long time. Chiefly because of the inevitable crockings, indigo has been dropped by many of the best worsted and woolen firms. Most of the expensive blue dress suitings that Yorkshire sends to Argentina are alizarin-dyed and makers are free from complaints as to the wear of the color. Indigo is used for government goods, and some suitings, but the largest consumers are the calico printers. The consumption of synthetic paste in this country is roundly 2,000 tons and of natural

indigo only a very few hundreds. It is understood that a new coal-tar indigo will soon be put on the market by a Hamburg company.

* * *

A member of the Manchester Society of Dyers makes the consoling suggestion that half the complaints of bad matching arise from subtle, unlooked for changes or fading of the standard shade pattern on which the dyer relies. But if the dyer's standard pattern fades why not the customers' also? Researches made by David Brownlie of this society lead him to accuse bacteria of causing colors on fabrics to fade. P. G. Jones has more definite ground for saying that the finishing of cottons is often responsible for marring the dyer's work. Dextrin appears to him to delay fading. Oils tend to render most colors fugitive. Each color acts after its own kind, some of them gaining or losing fastness accordingly as the oil used in finishing is neutral or alkaline. The presence of a little chlorine or alkali, or some obscure property of the material itself, is thought by one dyer to explain those changes of color that occur after dyeing even in the dark. These dyers are in a fair way to arrive at most interesting discoveries. Meantime, a consulting chemist, whose practice lies as much in wool-dyeing as in cotton-dyeing problems, declares that in his experience most obscure mishaps turn out to be due to the illicit presence of an acid.

* * *

The commitment for trial of a worsted superintendent for attempting to obtain cuttings of new ranges from a merchant's pattern man creates some remark. For knowledge of what their competitors are showing for the new season manufacturers are much beholden to commission house men. A glance at the novelties that the merchant fancies is usually all that is given or required and these little privileges go by favor. Even second and third-hand testimony has been many a time enough to set the competitor busy with the same general ideas. If a man is known to have taken patterns, the property of his employer, he may find a policeman with a search warrant up at his house. The powers are not used as often as they might be. For example, no steps have been taken against a boss-finisher who left his successor stranded for want of reference patterns which indubitably used to be in the department's books.

The revelation of confidential patterns is eyed by the trade as a misdemeanor. For giving orders on one man's patterns to another manufacturer, customers have before now been kicked into the street. All the same we have notorious persons—principally exporters—who substantially do all their trade with manufacturers who have not designed the patterns on which the order has been booked.

FIG. I.

* * *

On the whole, less trouble than formerly is taken with the final papering and make-up of fabrics. For foreign trade there is still a profuse use of pictorial labels—heathen or civilized. Fancy and elaborate papering is done for some markets in which buyers want to be able to lift a paper lid and draw out a long fold of cloth for examination and re-

placement without need for repapering. This is a refinement for which the modern world has not time, and pieces are papered in the simplest, quickest ways and are meant to be stripped for examination. We send out the heavier woolens with the lists bare, dress goods with both ends hidden by paper, cottons in all manner of wrappings. It is for use on goods papered completely and with a tab of cloth hanging out to show the shade, that the seal, Fig. 1, is designed. This red seal with black on white lettering, 1 3/4 inch diameter, bears on one side the initials "B. D. A" and on the other "Dyed and Finished

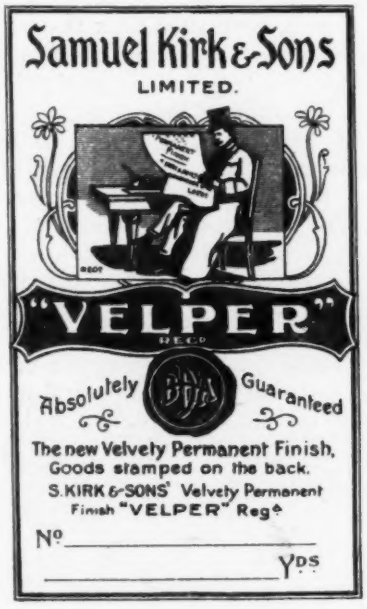


FIG. 2.

by Ripley's, Bradford, England." The initials stand for "Bradford Dyers' Association" and these splashes of bright red adorn a stack of goods, at the same time giving a good advertisement.

Another advertising ticket, Fig. 2, bears the same initials and is used on Kirk's permanent black cotton linings. The picture of a drummer reading of the virtues of this registered finish is one that has been made familiar to drapers by long advertising in dry goods trade papers. The ticket connects the advertising definitely with the goods.

COTTON BUYING AT THE MILL.

By A Southern Manufacturer.

Erroneous ideas prevail in many quarters regarding the buying of cotton at the mill. Some people have the idea that the mill receives great and material benefit from this method. An article was published recently to the effect that the mill got the advantage of the farmer in every way, that weight was deducted for bagging and ties then resold to the farmer. So far as our experience goes this is not the case. Very few farmers understand grading cotton, and one to three values are all they care to consider. Most of them have but one price. Nearly every farmer seems to think or would have you believe that his cotton is the best that can be grown. It may be the best he has grown and it is hard to convince him that his best may be strict middling or middling, while his neighbor's cotton is good middling. The same skill may not have been exercised in cultivation, or reasonable care used in picking, or the soils may be different. Carelessness at the gin has injured many bales of good cotton without the damage being known to the owner. Cotton can be spoiled at the gin in several ways. If damp when thrown in the hopper the cotton clings to the saws and becomes stringy or is badly cut. If the mote knives are not set right, what would be a strict or good middling bale becomes middling or poorer. Speeding too fast will destroy cotton as quickly as anything will.

The value of cotton is often lowered by the farmer's mixing several pickings, yet not caring to take the lowered value because there is some good cotton in the bale. Many farmers do not keep the low grades separate from the best cotton. If there is not sufficient good cotton to make a fair sized bale, the mill prefers to buy the good cotton in the sheet rather than have dissatisfaction over mixed cotton in the bale.

It is customary in many mills to take a man's entire crop, good and bad. This does not always work to the benefit of the mill. Frequently the low grade cotton has to be stored for several months, insurance paid on it, and possibly resold to some other con-

cern, with the additional expense and trouble of reweighing and hauling. It is sometimes asserted that the mill gains through not having to pay freight. That may be true, but there are many little inconveniences that a small mill located in a farming district experiences, especially if the mill is away from the railroad, that will in all probability offset the gain of freight. Moreover the farmer saves time in hauling to the mill and by the shorter time spent at the mill cotton platform.

The procedure generally is as follows: The cotton is sampled as the bales are taken from the wagon, the price fixed for the bale, which is weighed and tagged, and a receipt given. In many cases the price for each bale is marked down as it is weighed. Some desire the cotton to be sampled before unloading and a uniform price given for the lot. If the price for good middling cotton has been quoted, which is the highest price paid in this district, they still want the highest price for the lot. Here is a typical extract from the conversation between buyer and seller:

"What are you paying for cotton?"

"Twelve and a half cents for the best, good middling."

"I wish you would examine mine."

It is examined and there are 8 bales of good middling, 1 bale of strict middling and 1 bale of middling. The offer is 12 1/2 cents for good middling, 12 3/8 cents for strict middling and 12 1/8 cents for middling.

"No," says the planter, "I want 12 1/2 cents for the lot."

We do not deduct for bagging and ties unless the bale weighs less than 315 pounds, then 22 pounds is taken off. If a bale weighs 485 pounds with bagging and ties and it is worth 12 1/2 cents per pound, the seller received $60.62. The bagging and ties are sold to the ginners when the next crop is gathered. At present bagging and ties sufficient for one bale are sold for 45 cents, which is not near the value of the 22 pounds allowed for the covering on the cotton when it is bought. This helps to offset the freight. Wet and rotten cotton is deducted from the bale.

A bad practice is followed by some farmers. After the cotton is ginned the bales are left outdoors exposed to the weather often through the entire winter. At times this is because the farmers claim they cannot afford to build shelter; at other times for reasons best known to themselves. Any user of cotton will readily understand the effect of this bad practice, namely, blue and rotten cotton. Some farmers actually expect full price for bales that possibly are good middling in the center, but blue and inclined to be rotten on the outside. There is a loss to the mill from such bales, because cotton that has lost its natural wax and moisture will not work as well, no matter what is done to it, as cotton in good condition. Such being the case there is a loss both in production and quality. Who should bear that loss? Surely not the buyer. In other lines of business, in mill business, a reasonable amount of shelter has to be provided for the products. Why should cotton be an exception?

It has been claimed that a bale of cotton gains in weight after being exposed to the weather. We believe this is a mistake. If the exterior of the bale gets wet, then dries, gets wet and dries for a number of times, the cotton is damaged, the natural wax and moisture is lost and the cotton loses in weight. This neglect of cotton is not so serious as formerly. This is because the mill will take the cotton and store it, give the farmer a receipt and allow several months for him to complete the sale. He can sell the whole of his crop or a part. This relieves him of all responsibility and gives the mill the cotton in its best condition. The farmer can watch the market and use his judgment as to the time to sell. There are advantages to both sides in this method of doing business.

We have referred to the farmer spending less time at the mill when he brings his cotton for sale. At one public market we know of, as soon as a cotton sampler sees a wagon coming with cotton on it, he signals the driver, and by some unwritten law all other samplers and buyers concede the cotton to him, or rather, allow him to have the

first bid for it. Many farmers have spent an entire day at that market with one load of cotton, sometimes taking the cotton home rather than accept the offer made. Occasionally a farmer taking his cotton to the public market will have his load of four bales made into three or four grades. This seldom occurs at the mill.

THE SAMUEL CLOTH PRINTING MACHINE.

From L'Industrie Textile.

This new printing machine built by Messrs. B. Buffaud and T. Robatel, Lyon, France, consists, as shown at Fig. 1, of a small carriage arranged to travel along a table on which the cloth to be printed is extended. On the carriage is a printing roll, shown at the front of Fig. 1; a color box at the bottom; a color furnisher apron passing between the press rolls shown at the top of the machine. The printing rolls vary from 3 to 20 inches in diameter, making it possible to print designs from 10 to 64 inches in length. The pressure is very light, which makes it possible for the same machine to handle very different fabrics, such as light silks, wool goods, thick cotton goods, mixed fabrics, velvets, carpets, etc.

Along the table on which the cloth is extended is a gear rack, shown at the left of Fig. 1. The machine receives its power either from a dynamo, or as shown in the figure, by a hand crank. The driving shaft connects by gears with two horizontal shafts, one above the other. The lower shaft is connected at the other end by a gear with a gear rack, so that when the shaft is turned the carriage is moved along the table. During this movement the printing roll prints the design on the cloth. The construction is such that all slipping is prevented.

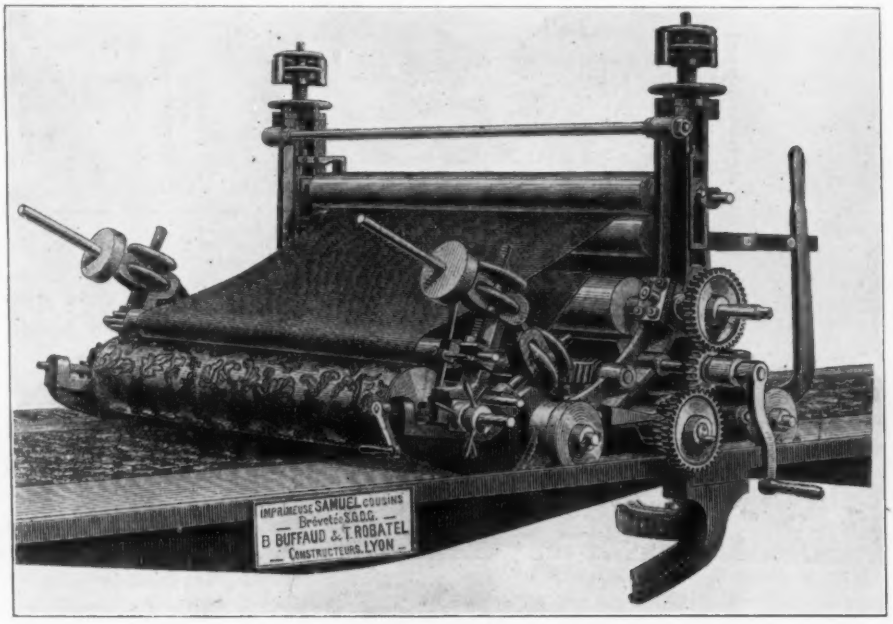


FIG. 1.

The upper shaft carries a rough surface cylinder which draws the color furnisher apron at a speed exactly equal to that of the surface of the printing roll. The color is delivered to the roll by a light pressure, which can be regulated as desired without

the slightest slipping. The color furnisher apron passes through the color in the box and then between press rolls on which the pressure is regulated by the screws, shown at the top of Fig. 1. The excess color is returned to the box and an apron receives only the quantity required for printing. This printing machine is so finely adjusted that the different colors are brought exactly to the desired position in the design.

The results in respect to production and quality of work are unexcelled by any other printing machine of this class. One advantage of the Samuel machine consists in being able to give the cloth several runs with each color in order to secure a thorough penetration of the fabric, making the back of the goods fully as attractive as the face. In this way the ground of the pattern can be made of a perfectly solid color, something that has not heretofore been possible. The machine is easily adjusted for any desired pattern, which enables printing to be economically done on short pieces of cloth.

The same printing machine can be used for printing a number of different colors on the same piece. All that is necessary is to change the roller and color, which can be done very easily. In practice, however, it has been found that as the printing machine is sold at a low cost, it is better to use a number of machines, each serving for a separate color. This machine is built to print 32, 44 and 52-inch goods. Fig. 2 is a perspective view of the machine in operation.

FIG. 2.

CARD GRINDING.

(From the Grinding and Mounting of Card Clothing recently published by Dronsfield Bros., Ltd., Oldham, England.)

(Continued from May.)

The remarks we have made upon the difference of point produced by these two grinding instruments are doubly applicable to the grinding of flats. The flats rotate so slowly that for all practical purposes, speaking in the grinding sense, they may be said to have hardly any motion at all. Contrast the surface speed of flats with those of cylinder and doffer. Now, in the lateral traversing motion of the grinding roller, which has its full width of emery lying across the full width of the line of flat teeth, the wire teeth have very little chance of escaping the "buckling" which must occur as the direction of traverse changes; this "buckling"

of the teeth results in barbed points, and if the roller should be set heavily, broken teeth are frequently found as a result. On the other hand the traversing wheel of the emery wheel grinder acts upon the teeth alternately from side to side in a "brushing" manner, producing sharper points with less barbs.

Frequency of grinding of the flats upon the card is governed by conditions, but, as mentioned, as the flats are ground during work, they may be operated upon at any time without respect to system, as demanded in the grinding of cylinders and doffers.

2a. Flats off the Card: Probably, since its introduction, no part of the revolving flat card has received so much attention, or has caused so much dissatisfaction, as the parts concerned in the grinding of the flats. When the revolving flat card was introduced, the makers said: "Here is a machine in which the flats can be ground in position without the necessity of detachment." This, of course, alluded to the system then employed in connection with the wood flats of the "wellman" card. But, before long, spinners discovered the difficulties emanating from the grinding of flats on the card, and the impossibility of obtaining true flats setting equally to the cylinder, and means had to be devised for improving the conditions. Since that time many flat grinding motions have been invented and applied, and although some of them, properly handled, tend to betterment in this direction, much remains to be accomplished ere flats may be ground with that regularity which good carding demands.

Flats must be ground in carding position to ensure truth and regular setting to the cylinder, owing to natural deflection in the flat itself. Most of the flat grinding motions are situated in the ordinary grinding position on the top of the card, and the flats are ground with the wire upwards, the reverse of carding position. Thus the deflection is duplicated, as the center of the flat does not receive the same amount of abrasion from the emery as the ends, and this central portion, insufficiently ground already, upon turning over into contact with the cylinder, deflects, or "sags," still farther.

Apart from deflection, however, there are other causes of irregular grinding of the flats upon the cards. For instance, the flats, to the number of, say, 108, are individually joined up into an endless chain by the securing of the ends to two separate chains. These chains are drawn by means of sprocket wheels over the bends of the card. It will be seen that any elongation of the chains must of necessity throw the flats out of line, one with the other, thus making it impossible for the flats to be presented in a parallel line with the grinding roller. This is one of the main causes of "shiners," or streaks, resulting from portions of wire having missed the abrasion of the emery.

Another drawback to true grinding, without the use of motions, is the fact that the flats are held, when being ground, in the milled seatings at the back of the flat. Seeing that, during carding, the flats slide over the bends upon the bevelled seatings, milled upon their end faces, it is clear that any irregularity in wear of these two separate seatings, back and front, must render it possible for the flats to be ground so that they shall afterwards set alike to the cylinder.

The principal difficulties which present themselves in regard to the grinding of flats upon the card in working position may be summed up as follows: Flexibility of the flat; lack of rigidity during the grinding process; the multiplicity of bearing or sliding surfaces, and the consequent irregularity of wear upon the same. How, then, should flats be treated in order to produce a series of flats which shall possess a true plane of teeth and set equally to the cylinder, to the elimination of high and low flats? The answer is, by grinding them in carding position, off the card, with the carding seatings, i. e., the milled bevelled faces, resting in seating plates to match them. Many will object to the extra labor involved by taking off and replacing the flats; but to these we assure better setting, better carding, more points at work, therefore greater production. The labor necessary has been reduced to a minimum. The machine now in use for this type of grinding is the Dronsfield patent automatic flat grinding machine, with flat

testing apparatus, Fig. 23. About 1,300 of these machines, more or less improved in detail, are in use, so the reader may know that there is nothing experimental about the

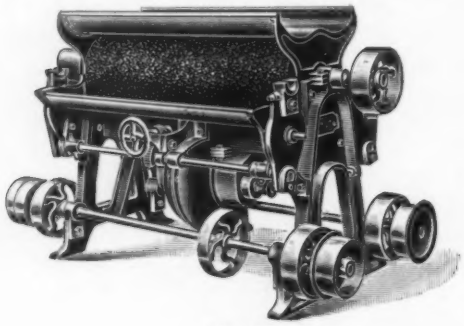


FIG. 24.

system. It is usual to grind one set of flats per week, one machine serving about 50 cards. In this way each set of revolving flats is trued up thoroughly once a year, and during the truing process the flat bends and other portions of the card may be cleaned and thoroughly overhauled. If it should be found impracticable to stop the card for a whole week, a set of extra flats may be obtained to replace the set undergoing grinding. The systems in vogue are various. Some carders prefer to grind a few at a time, inserting dummy flats in the meantime; but the plan we advise is the best—thorough overhauling at one and the same time.

Of course, it is evident that the periodical grinding of flats by the flat grinding machine, say, once a year, is not sufficient to keep the flats in the necessary condition as regards "point." In the meantime the flats are touched up occasionally by the long grinding roller, or emery wheel grinder, to renew the points. The patent flat grinding machine is adapted to grind three flats at a time, and is fitted with automatic feed motion and stopping motion, by the aid of which a considerable amount of labor is saved, and loss of time avoided. The machine is simple in operation, and, with the following directions, any unskilled workman may undertake the grinding of flats with the assurance that the flats will leave the machine perfectly true one with another, and each in itself.

A set of flats is taken off the card and replaced by an extra set, or a set which has just been ground. It is then necessary to find the lowest or most worn flat by means of the flat testing instrument, C, as, to have all the flats alike after grinding, all the remaining flats must be ground to the level of the lowest. Then test the amount of irregularity of this lowest flat, discovering the number of marks of irregularity indicated. Each mark represents 1/500 part of an inch. Let us assume that the irregularity of this flat amounts to four marks, 4/500 from the lowest to the highest indication on the indicator arc. Fix this flat in the center pair of bearings situated over the grinding roller, and, by means of the handle of the automatic feed gear behind the roller, wind same until the pointer indicates the figure four on the indicating arc of the feed; this is the fourth mark from the bottom or stopping point. Then put the machine in motion and bring the flat into contact with the grinding roller by means of the hand wheel, A, of the hand setting motion at the front of the machine. As soon as the flat commences grinding, the hand wheel, A, should be locked by the thumb screw provided, and should not be touched again until the whole set of flats has been ground. The flat, lowest or sample flat, will then feed down automatically from the fourth point to the bottom or stopping point, when the machine comes automatically to a stop. This forms the stopping point for every flat. The feed motion will grind as much as eight marks altogether, and no matter where the flat commences grinding, the stopping point is always the same.

The sample flat is now taken out, having had its four marks of irregularity ground off, and three flats (any three) are inserted in the machine.

(To be continued.)

The production of artificial silk in Germany rose to about 1,180 tons in 1908; but even this was not equal to the demand, for about 300 tons were imported into that country from Switzerland and Belgium. The total production of artificial silk is estimated at about 4,000 tons.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

Twisted Rolls in Carding.

Editor Textile World Record:

I send you with this letter samples of twisted rolls or nubs which form on our cards in carding English wool graded as 46s. These rolls form between the fancy and the doffer. I can lay on the floor and see them drop under the card after having been drawn down by the cylinder. I changed the speed of the tumbler thinking that it held the stock too long, but there was no improvement. The card is 48 by 48 with 34 wire on the cylinders. The fancy is 9 inches in diameter clothed with 28 wire, open set. I have tried setting the workers close and away off, but without helping matters any. The difficulty is encountered only with this 46s grade of wool. It occurred to me that the rolls might be caused by the wool being gummy. I would like very much to have you tell me what will remedy the trouble.

Carder (1163).

These rolls are made by the fancy which has too coarse a wire for the cylinder. The fancy wire should be at the most only two numbers coarser than the cylinder wire. In most cases the same wire is used. The stock like sample requires but little work from the fancy, it lays on the points of the cylinder wire, and in this position it is in the right place to be rolled by the fancy. A 28 wire fancy running on a 34 wire cylinder would be about right for rolling the stock. Sometimes a coarse fancy will throw bits of stock on the doffer where the draft of the fancy will keep it rolling until it goes back in the card or drops on the floor. A fancy stripper can be used to good advantage on some kinds of stock to prevent rolling.

Lytton.

It would be very easy to locate the trouble if I had an opportunity of examining the work on the card, but it is difficult to point out the remedy at a distance and with only such particulars as "Carder" gives. The stock is long and hard to raise and card out. There is a natural tendency for it to roll. To do good work the card must be in A1 condition, with all belts tight, especially the lickerin and fancy belts. The cards should be set fairly close, especially the doffer and fancy. The speed of the fancy must be just right to raise and clear the cylinder, otherwise it will load and cause rolls. It might be a good plan to reverse the workers. This will card the stock out better, but it will be harder on the staple and on the wire. I think most of the trouble is due to the setting and speed of the fancy. The fancy belt should be tight and the clothing kept sharp. More work is spoiled on the card by the fancy than at any other point. Rogers.

Mildew in Yarn.

Editor Textile World Record:

Is there anything that will take mildew out of yarn? We have some yarn which has been mildewed and are going to bleach it. Would this be the proper method to pursue? Carolina (1181).

Bleaching the yarn will remove the mildew providing it has not gone too deep into the fiber. For removing the mildew without going to the expense of bleaching mix a solution of one pound of chloride of lime to ten or twelve gallons of water. Steep the yarn in this solution for ten to fourteen hours, according to the amount of mildew on the material. If the goods are heavily mildewed, make the solution a little stronger, say one and one-half pounds of chloride to twelve gallons of water, or let the yarn steep a little longer. I would advise trying a small quantity of the yarn with this solution at the first strength, as there is no danger of this mixture making the yarn tender. Do not use the sediment of this solution, let the mixture settle and use the clear liquor.

If the goods have gone beyond the first

stages of mildew, a stronger solution will be required to remove it. The first stage of mildew is pink, then red, and then changing to green and black with a fringe. After the spots are removed wash the goods thoroughly so that no trace of the chloride is left. Then either bleach to a white or dry the goods for other processes. Delco.

Production of Cotton Machinery.

Editor Textile World Record:

In looking over your book, "Kinks for Carders and Spinners," on page 80, I find an article signed "J. T. B.," in which there are several errors in the makeup for machinery. He gives one opener, one intermediate and one finisher picker to produce 22,000 pounds of yarn. Whoever heard of a single picker doing this amount of picking. He must have guessed at this layout, but he wants to guess again in order to give a correct layout and cost.

Profile (1186).

We referred "Profile's" letter to "J. T. B.," who replies as follows:

I have not time to go into a long explanation as to how it is possible to produce 22,000 pounds of yarn from a single picker, as any practical man knows this is being done in many coarse yarn mills. As a matter of fact, "Profile" had better inquire how they account for the figures taken from Howard & Bullough picker production tables. Under intermediate and finisher production we find the following given as the product for 10 hours, running a 14-ounce lap: Revolution per minute of 9-inch roll equals 10.174, using a 7-inch feed pulley; this gives 3,780 pounds per day, which for a 60-hour week would equal 22,680 pounds. In the same table for a 15-ounce lap we obtain 4,040 pounds per day or 24,240 pounds per week. Again if "Profile" will refer to the Kitson Machine Co., he will find 22,000 pounds per week quite possible. Taking up the article referred to, you will find it is only approximate, and the statement of "about 22,000 pounds" was given because a layout must be very flexible, as 6s to 24s were to be made in a small mill of 5,000 spindles. For instance, "good middling cotton" was specified in the question, and if this grade was used on all yarns, then the intermediate could be used as a finisher, and two process picking resorted to. If, however, on the coarser counts a lower grade of cotton was used, the three process of picking could be used, and by making a heavier lap, the product of the pickers would increase accordingly. By the above methods the extra cost of machinery is avoided.

Referring to the remark regarding my guessing ability, would say that it is not my fault that "Profile" did not know pickers could produce so much, and I now "guess again" by stating that if he had given as much thought to his letter as I did to the answer which he refers to, I believe he would have left out the last portion of it.

J. T. B.

Horse Power of a Waterfall.

Editor Textile World Record:

Please give the rule for estimating without instruments the flow of the water over a waterfall. Also give me the rule for estimating the number of horse power where the height of the fall and the flow of water are known, the latter having been found by the rule asked for above.

Maynard (1167).

The following is the method for the measurement of an open stream by velocity and cross-section to arrive at the theoretical horse power of the stream: Measure the depth of the water at from 6 to 12 points across the stream at equal distances between. Add all the depths in feet together and divide by the number of measurements made; this will be the average depth of the stream, which multiplied by its width will give its area or cross-section. Multiply this by the velocity of the stream in feet per minute, and the result will be the discharge in cubic feet per minute.

The velocity of the stream can be found by laying off 100 feet of the bank and throwing a float into the middle, noting the time taken in passing over the 100 feet. Do this a number of times and take the average; dividing this distance by the time gives the velocity at the surface. As the top of the stream flows faster than the bottom or sides, the average velocity being about 83 per cent. of the surface velocity at the middle, it is convenient to measure a distance of 120 feet for the float and reckon it as 100.

Water Power:

English Rule: 33,000 pounds raised one foot in one minute = 1 h. p.

200 pounds of water (20 imperial gallons) 3 feet fall per second = 1 h. p. or 60 gallons 1 foot fall per second = 1 h. p. Therefore: 224 gallons = 2240 (lbs.) × 3 (feet) × 60 (seconds) ÷ 33,000 = 12.2 h. p. Deducting 25 per cent. on account of turbine loss gives 9.8 actual or effective h. p.

If the sectional area is taken in small sections and different rates of flow, 10 per cent. for friction would be about right.

The gross power of a fall of water is the product of the weight of water discharged in a unit of time into the total head, or the difference of vertical elevation of the upper surface of the water at the points where the fall in question begins and ends. The term "head" used in connection with water wheels is the difference in height from the surface of the water in the wheel-pit and the surface in the pen-stock when the wheel is running.

A water wheel or motor of any kind cannot utilize the whole of the head since there are losses of head at both the entrance to and the exit from the wheel. There are also losses of energy due to friction of the water in its passage through the wheel.

F. S. Hinds,
Architect and Engineer.

Stains on White Silk.

Editor Textile World Record:

We are having difficulty with the dye from black silk waste staining the white silk striping threads during the process of dyeing. Our goods contain a certain proportion of tussah silk which we color black ourselves. The goods are also woven with white silk striping threads. We find that during the process of finishing the color runs from the black silk and stains the white silk badly. Can you tell us how to overcome this difficulty?

Tussah (1166).

The trouble experienced in this case is evidently due to the black dye with which the tussah silk is colored bleeding off when the woven fabric is soaped in the finishing operations. The color thus bleeding from the black tussah is taken up by the white silk striping threads. This defect can be overcome by employing a faster dyestuff for the dyeing of the tussah silk in the first place. The dyestuff at present employed is evidently not of sufficient fastness to washing. To attain the requisite degree of fastness evidently required by the finishing operations to which the fabric is subsequently subjected, I would recommend using a sulphur black dye, such for example, as Immedial Black F F extra. This dyestuff is applied to the silk in a bath of sodium sulphide and glucose. The latter substance prevents injurious action by the caustic sodium sulphide on the silk fiber. The details of the process for dyeing may be obtained from the manufacturers of the dyestuff. The choice is not limited to Immedial Black but a number of the other well-known sulphur blacks on the market may be used. A black of good fastness to washing may also be obtained by the use of an after chromed acid dyestuff, such as Diamond Black. These blacks are dyed in an acid bath, and after the bath has become exhausted the goods are lifted and an addition of 2 to 3 per cent. of chrome is made. The goods are re-entered and boiled for 15 to 20 minutes longer. Howell.

The Combustion of Wool.

Editor Textile World Record:

I have had a little discussion regarding the possibility of wool burning. My claim is that wool would not burn, that is, flame. The other party who was mate of a ship loaded with wool from South America, said he went into the fore hold and found a bale of wool way up in the eyes of the ship that was thoroughly wet from seas washing over the bows, that had burned or was burning and setting fire to the surrounding material. What I would like to know is whether the water, either salt or fresh (this of course was salt) could cause combustion in wool? The mate claims it will burn so as to set fire to other material. The writer's claim is that it will not flame enough to set fire or burn without constant contact with fire or being saturated with some chemical that makes it combustible. Maxwell (1173).

If wool comes in contact with fire it will flame and frizzle up into black curly ashes. If it is wet by either salt or fresh water and left in a warm, close atmosphere, it will be but a short time before spontaneous combustion will ensue, and it certainly will then flame up. It is a curious fact that wool will remain sound so long as it is kept submerged. At the time of the wreck of the S. S. Venetian in Boston harbor, there

were some bales of Australian wool that were under water for several weeks, and when they arrived at the surface they were quite sound, but almost immediately after the air got to them, they began to decompose and throw off a strong gas of ammonia. As I remember the case, they were put on flat cars and rushed to the wool scourer and much of the wool came out all right. Jameson.

Our English correspondent replies as follows:

If the ship's officer is correctly reported he saw a most wonderful sight; so wonderful that whole tribes of Eskimos could not bring others to believe without seeing for themselves. The very waves that wet the bale would prevent it from flaming—if nothing else did. Assuming for the moment that the bale contained wool, the whole process of its heating up can easily be reconstructed. The bale got wet and the only known way by which water can breed fire in wool is by facilitating fermentation. The moisture started microbial action and the micro-organisms attracted oxygen and set up a combination of oxygen with carbon. They multiplied rapidly in conditions of temperature favorable to them and their heat was stored and accumulated by the layers of extremely efficient nonconducting material (wool) around them. The heat increased in the affected area to such a pitch as to crisp, tender and finally char the wool at the center of operations. This is the simple history of nearly every sea-damaged bale and of hundreds of bales that are annually packed wet. They arrive, and for weeks after are hot enough in the center to burn the skin perceptibly. But the bales don't blaze and set fire to other goods and the insurance companies recognize the non-flammable character of the material by charging half the premium that is payable, for example, on shoddy.

Lots of men have made acquaintance with sea-damaged wool and lots more have burnt samples of wool experimentally to see what happens. The fiber swells and there is a production of mushy, shelly noncombustible ash and this ash is itself a preventative of the spreading of fire from the heart of the bale outwards to the sides. Red heat in the center has to combat this ash, to struggle against the non-conductive nature of the outer wool and to expel the surface moisture before it can extend to the bale covers. With a furnace-blast of air playing directly on the central source of heat the bale might be burnt out and become a cause of conflagration But the central source of heat is tightly protected against any blast likely to be found on shipboard. And as a matter of experience the circumstances detailed by the mate do not happen. It is for the seafarer to explain how in the darkness of the forehold, amidst the suffocating smoke that must have accompanied the phenomenon of which he tells, he is able positively to say that the material that was setting his cargo alight was a bale of wool.

Following distinguished precedent the seaman had better amend his discovery. If he likes to say that the bale contained, not wool, but wooled or unwooled sheepskins, there is a chance of regaining a reputation for veracity. The fat in wool is not liable to inflame by oxydation, but the body-fat of sheep is. Fires in ships have originated with hides and everybody knows how mutton fat blazes when once alight. The oxydation of a fat is unlike the process of fermentation occurring in fleeces. To see how fats oxydize, place a spot of linseed oil on a dry cotton rag and leave it hanging in a warm room. Under favorable circumstances the oil-soaked spot will char as a consequence of its greedy absorption of oxygen from the atmosphere. The firing of skins is analogous to the spontaneous ignition of oily waste and is promoted by whatever feeds the oxydizable fats with their supply of oxygen. It occurs by a process separate from that by which wool heats and it will be found that marine underwriters recognize a distinction between the risks on the two classes of merchandise.

Regent.

The highest price paid the men workers in the cotton mills of China is 30 cents a day, while a good average wage is 8 or 10 cents.

Water Required for a Dyehouse.

Editor Textile World Record:

How much water is required to operate a bleachery and dyehouse? Buxton (1162).

It would be difficult to state the exact amount of water required to operate a bleachery or a bleachery and dyehouse on account of the amount of waste for washing down purposes.

The amount would also vary according to the process used and the different methods employed in bleaching piece goods, and bleaching and dyeing yarns or raw stock. For a bleachery producing piece goods, and equipped to handle from 30,000 to 35,000 pounds of piece goods per week, with the following machines: Two large washing machines with two three-inch valves each, two squeezers with two two-inch valves each, one lime machine with one two-inch valve and four kiers for boiling purposes, the quantity of water required would be from 800 to 1,000 gallons per minute. These figures are based on the assumption that there will be a steady flow of water passing through the machines during the washing-out process, which is necessary in the production of piece goods, besides supplying the finishing end with water at the same time. It is essential that the water used for finishing the goods should be perfectly clear.

A small dyehouse working on yarns and raw stock would not require as much water as a bleachery working on piece goods. Most of the washing is done in the closed machine, then run off and the machine filled up again until a thorough wash is obtained, instead of having a steady flow of water passing through the machine as in the process for piece goods.

A small bleaching and dyeing plant for yarns and raw stock equipped to produce from 2,000 to 2,500 pounds per day would require from 2,000 to 2,500 gallons of water per hour on an average day's work. The quantity required would vary according to the methods employed and the process required. A few years ago I was in charge of a plant producing 60,000 to 65,000 pounds of piece goods per week, with three large washers, three squeezers, one lime machine and six kiers. For this plant we had a rotary pump lifting 1,800 gallons of water per minute and we did not have any too much; of course it supplied the finishing end as well as the bleachery.

I would advise having too much water rather than not enough, and run the risk of having tender goods through not being thoroughly washed. Delco.

Marking Buttons for White Goods.

Editor Textile World Record:

We have difficulty in marking buttons for white goods. If we use red or blue pencil the marks will not come off. Kindly give us some information on this subject. Dawson (1189).

For marking the place to sew on buttons we have always used an ordinary soft black pencil, making a small dot where the button is to be sewed on. With a little care the button could be sewed right over the dot. This is done on all balbriggan underwear. However, I would suggest that "Dawson" get crayon or chalk pencils, like tailors' chalk, which will not only rub off, but can also be brushed off. Lafayette.

Blotches on Knit Goods.

Editor Textile World Record:

The enclosed sample of fleeced knit goods as you will see has a blotched appearance. This cloth is made of good mule spun yarn. Before it is dyed it is given what we call a half bleach to clean it of specks. The process is as follows: First boil out in an open kettle using 5 pounds of soda ash to 100 pounds of cloth, boiling 3-4 of an hour. It then goes to the line bleach running 15 minutes at 2 degrees Tw., and then to the wash bath. From the wash bath it goes to the anti-chlorine bath for 20 minutes, then rinsed for 20 minutes, next to dye bath and boiled 45 minutes, adding the dyestuff as the goods are boiling. Then extract for 10 minutes, putting in 3 rolls at a time and then dry over upright pipes. Can you inform us how the blotches can be prevented? Raleigh (1188).

I should say that the trouble is in the half bleach, as cloth that is bleached will take the dyestuffs better than the unbleached cloth. The blotched appearance is caused by the cloth not taking the dye evenly. In dyeing of Egyptian or balbriggan shades it is difficult to get the cloth to take the dye evenly. The cloth should be an even shade to begin with. Raritan.

Knitting Department

THE KNIT GOODS SITUATION.

There have been a few buyers in the market during the past month, but the orders left by them have made no ripple on the quiet sea of dullness that has been so much in evidence for several weeks. A few stock lots of ladies' ribbed vests were closed out, but the total volume of the business done in the primary market has been so small as to be scarcely worth mentioning. The buyers who were here left the impression that their stocks of merchandise were heavy and no interest could be aroused in additional business on any regular lines of spring goods, even at old prices. They were, however, quite insistent on the delivery of all goods that were due on early orders, and, notwithstanding the fact that some of the manufacturer's agents stated that it would be another month before deliveries could be made on some lines, there seemed to be no disposition to cancel anything.

Business on fall lines is also at a standstill. The jobbers have been put out and apparently have taken about all the early business that there is to be had and now must wait for the season to open before much more can be done on heavy weight goods. This condition is, of course, reflected in a lack of business between manufacturers and jobbers. It must not be taken from the foregoing, however, that manufacturers are not busy. Those who work on light weights secured a large initial business last July and are still busy making shipments of goods sold at that time and those manufacturers who are making heavy weights claim to be well supplied with orders in practically all lines. It is said that some makers of both light and heavy weights have run out of orders on the light weights somewhat earlier than usual, but having a good business on heavy weights to turn to, have changed their machinery over sooner than they would have liked.

The most important question heard round the market these days is, "When will the new spring lines be opened?" It is said that the manufacturers of men's balgriggan lines agreed at a meeting held in Utica some weeks ago, to show no samples nor quote any prices until after June 6, and chances are that manufacturers of other lines will probably delay their opening until about the same time. We are told that there are a great many samples in the hands of selling agents, but that manufacturers are waiting to get into a position where they can say something definite in regard to prices. This, of course, depends wholly upon the situation in the raw cotton market.

The fact that the price of cotton continues to rule so high, makes it extremely difficult for manufacturers to price their merchandise attractively. If this condition continues to exist it will probably mean a late opening and a long drawn-out selling season.

HOSIERY.

The hosiery end of the business has continued very quiet during the past month. Some of the agents and manufacturers have made some short Western trips in an effort to force business, but it has not resulted in any great volume of orders being placed. It is said now that some mills are making up stock, rather than shut down, and by those who are in a fairly good position to know, it is predicted that with a short spell of warm weather there will be no difficulty in cleaning up any stocks that might be made up, because of the fact that quantities of merchandise in the hands of jobbers are small. There seems to be no good reasons given for the lack of business other than the cold weather than has prevailed during the past month. A year ago this condition might have been accounted for by the heavy importation of German goods. The large quantities brought in at that time have now been disposed of and the field left more open for the domestic manufacturers.

Chicago, New York and other large cities

are still taking plain colors, such as blue, brown, grey, lavender and green, very largely, and from New York we learn that the high class trade are taking freely of the grey mixtures with black clocking to go with the grey mannish looking suits that are being worn. Another high class color shown largely in silk hose is the raven's wing blue.

Advices from Chemnitz state that solid colors are to be good for 1911, but that up to the present time most importers have placed their orders in bulk without specifications as to colors wanted, and are leaving these details to be sent out after the sample sets are received on this side. Some of the larger buyers have bought fine gauge lace hose very freely and there is considerable talk of a revival of this class of goods. Gauze cottons and lisles have reached such a volume as to be looked upon now as staples and have been bought in large quantities. Embroidered goods and fancy novelties are being taken in limited quantities.

SWEATERS.

The outlook for the sweater business is bright, although the past month has been somewhat quiet, but as the season approaches for automobiling and other out-of-door requirements, the sweater coat is coming into its own. On account of this increasing popularity of the knit coat, there has been a great increase in the number of manufacturers making these goods. While the aggregate business is much larger, there are instances of some manufacturers being short of orders just at present.

At this time of the year the longer coats are having the call, those running from 36 to 39 inches being taken most freely. There is also noticed a tendency for those with military and turnover collars, but for fall and winter buyers are placing their orders on shorter length coats and without collars, as they are almost invariably worn under cloth or fur coats.

In the higher grade lines there is a good demand for solid color garments in scarlet, pomard, sage, Alice, olive, old rose and reseda. Of late a new shade of very light grey, known as snow, is finding considerable favor. Some very handsome garments are being shown in this shade made in derby rib stitch with high collars and large pockets with pointed lapels to retail at from $10.00 to $12.00.

FULL FASHIONED KNITTING.

BY PAVONIA.

(Continued from April)

The manner in which the yarn is drawn from the spools is illustrated at Fig. 46, which also shows a mechanism for taking up the loose yarn at the end of drawing course, and for manipulating the thread to the best advantage for selvage formation. This device is called "the snapping tackle." All the yarn passes through these snappers; generally one thread through each, although two, three, or any number of threads may be run through a single snapper if threaded into one carrier only.

After a course of loops is formed, during which time the yarn is free to be drawn into the needles by the sinkers, the snappers make an upward movement, causing the spring to pinch the yarn, pulling it tight and preventing it from becoming entangled in the needles and moving parts.

The varying motion of the snappers is gained by a lever and cam-motion directly from the main cam shaft, which is also shown at Fig. 46. An ordinary 18-section legger will have 72 of these snappers, or as many as there are thread carriers on the machine. These snapping mechanisms have undergone numerous minor changes in the development of the various machines, but the Wm. Cotton principle runs through them all. A variety of combinations is employed to suit the different kinds of fancy goods, such as stripes and plaited work, etc. To carry out these combinations, the snappers are attached to several rods, any of which can be thrown in or out of action at will by a pattern chain or other mechanical contrivance, the rods and snappers being chosen in threading up the different yarns to work in harmony with the thread carriers as they are thrown in or out of action.

The Cotton machine can be operated as a

simple knitting machine, without other appurtentances by which shaping or fashioning becomes possible. To make any straight fabric such as shirt bodies, the widening or narrowing apparatus is not needed, and many Cotton machines are in operation which have no appliances other than those necessary to produce plain knitted mesh.

The real Cotton full-fashioning machine must have some method of automatically shaping the garments which are being knit,

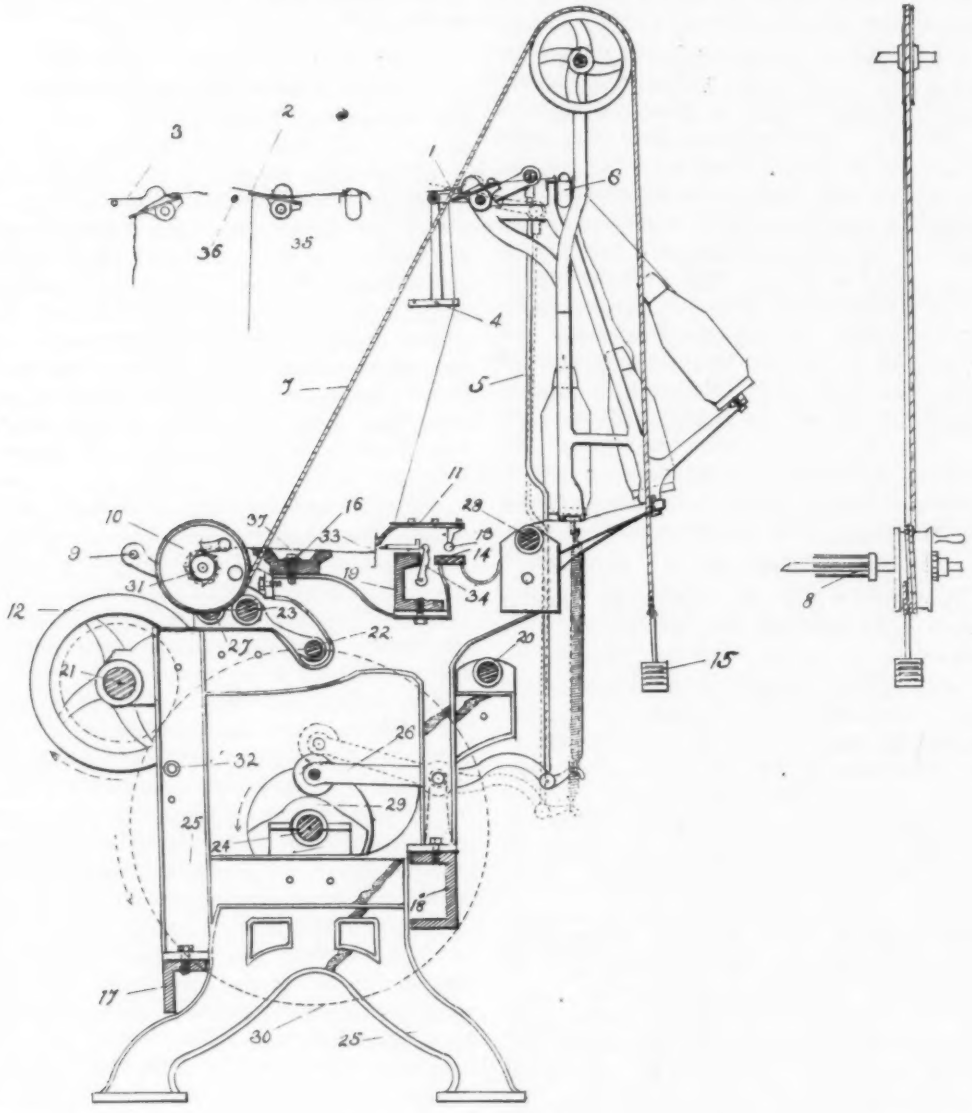


FIG. 46.

and an explanation of this part of the system will now be attempted.

The practical application of this fashioning motion on the Cotton machine was, as in a majority of the other component motions, a

conversion of an old handworking principle into an automatic arrangement. The most perfect manner in which this has been applied, supported by the ease with which the change from knitting to fashioning motion is accomplished, has done more to make this machine a success than any other feature.

It is not to be supposed that no change even in this, the most intricate part of the Cotton machine, has been made, for the details of the fashioning arrangement are the result of many men's ideas since the days of the original inventor, but the fundamental principle as explained will cover all Cotton machines of whosoever construction, whether English, German, French or American.

In the first place we will consider the mechanical means by which the automatic shaping is made possible, and afterwards try to show how the shaping is actually done. By referring to Fig. 8, representing a cam shaft, or to Fig. 12, it will be seen that some bosses carry two sets of cams. These extra cams are for narrowing or widening operations. In each instance where the same roller or arm actuating some factor in the knitting operations is required also to transfer its assistance to the fashioning motion, a pair of cams bolted together on one boss is seen. One is designed only for the knitting and the other for the shaping of the knitted fabric, but when an entirely new motion, applied only to the shaping requirements, is used, a fashioning cam only is put on. When the knitting is taking place, the roller runs on an idler formed by the outer circular edge of the boss on which the fashioning cam is bolted.

To enable the two cams to operate with a single roller a shifting device is used which causes the whole cam shaft to move lengthwise a distance sufficient to change the position of the rollers from running continuously on one cam to the other.

During the knitting process the rollers which give motion to any part of the actual knitting machine must be governed exclusively by the knitting cams. These cams being half an inch thick it becomes necessary for the whole cam shaft to be moved sideways that distance to change the rollers from the knitting to the fashioning cams, for the rollers which receive the motion from the cams, at any rate those which receive both knitting and fashioning motions, are of the width of one cam, and can therefore take only the one cam motion until the edge of the other has moved into its path. This can be easily understood by referring to Fig. 12.

The paths of these rollers are stationary in a plain hosiery machine, that is, they have no side motion, and when the change from knitting to fashioning takes place, instead of the rollers being moved over to the path of the other cam, as would seem to be the easier plan, they keep their position while the entire heavy cam shaft weighing in the neighborhood of half a ton, is slid over into their path. The process of moving from knitting to fashioning cams begins at the point, Fig. 44, in the cycle of motion of the machine. A movement of about 25° is necessary to make the complete change at full speed without creating undue jar and strain on the machine. At a corresponding point in the fashioning motion the change is made to knitting again.

However much the two sets of cams may vary at all other points, they must be alike over these few degrees, or at some point in this space they must be similar, because most rollers are, either by the weight of their accessory parts or on account of strong springs, kept in contact with the edge of the cams at all times. There is considerable pressure on the cams by the rollers, and any unevenness between the knitting and fashioning mates would be sure to cause trouble in shogging over and back again.

Besides the actual knitting and fashioning cams, there are a number of instances where a third cam is used to vary one or the other of the two principle motions. For the operation of these a shifter is usually applied to the roller. In no case has the writer seen or heard of the entire cam shaft having more than two working positions. These automatic and individual rollers shifters are needed only on machines that are

designed to make lace goods, stripes or some other fancy fabric, and apply only to a third cam or to some action not able to be timed with the movement of the cam shaft.

Referring to Fig. 46, it will be seen that there are four cast iron rafters, 16, 17, 18 and 19. The upright standards indicated at 25, which are inserted every two sections, are bolted firmly onto these rafters and they form the framework of the machine. On an 18-section machine there are ten standards, one at each end and one between each second section.

While the chief function of these four rafters is to form the framework of the machine, insuring the utmost rigidity when bolted to the standards, they also form the base to which many working parts of the machine are attached. For instance 19, which is the "head-rail," forms the bed onto which all the sinker heads and jack heads are fastened, as plainly shown in Fig. 20. The "back rafter," 18, contains the bearings and lever motion of the sinker drawing apparatus, the snapping lever fulcrum and a number of other accessories. The length of stitch is controlled by arms carried on a shaft, the bearings of which are attached to the front rafter, 17; the pattern arrangement on a number of machines is also carried on this rafter.

The top rafter or rail, 16, contains the sliding devices which support the bars and rods used to convey the tension of the fabric. Other attachments have their base on this portion of the framework. On a machine of American construction the lower angle rafters have been displaced by round shafting. This seems to be a unique departure from the Cotton plan of building the frame work, but no change in the general principle of the knitting action is caused by this change.

At 1 is shown a snapper in working position, the dotted lines showing its high point when in operation. The two positions are seen better in 2 and 3, the latter showing the spring closed on the loose yarn and the loose yarn being drawn tight. In the position shown at 1 the snapper is open, the spring being prevented from following the guide downward by a rod which runs the whole length of the machine. When the snappers are in this position the yarn is free to be drawn into the needles. The snappers are held on the center rod, 35, by set screws, and all open and close simultaneously as the springs are bent against the rod, 36. At 5 and 26 is shown the lever and connecting rod which actuate the snapping motion, deriving their movement from cam, 29. On most machines the yarn is run over a wick or piece of flannel which is saturated with oil. This is shown at 6. One object of this oil cup and wick is to make a friction on the yarn so that it will stop the instant the sinkers cease drawing the course. The yarn is pulled from the spools at a considerable velocity and unless there is a friction of some kind, the tendency is for the yarn to continue in motion and cause a greater slackness than can be taken care of by the uplfiting of the snappers.

The stopping and starting of the thread through the guides at the beginning and ending of each course is the cause of a considerable amount of extra adjustment. It would not casually appear that any considerable extra pull would be required at the beginning of such a course, but the inertia of the standing thread causes smaller loops to form and creates a greater liability to cut at the selvages than after the yarn has acquired momentum. To destroy the momentum at the finish of the course and also in some degree to soften the yarn by oiling or wetting are the functions of this oil cup. On some machines the oil feature is eliminated, but the friction arrangement is retained, some substituting glass rods or other substance by which the inertia of the stationary thread is more easily overcome.

The weights, 15, attached to the rope, 7, give tension to the fabric when wound around the drum, 10. The drum is loose on the tension rod and the tension is applied through the ratchet, 31, which can be connected or disconnected instantly by pressing or lifting a catch. More or less weight can

be used at 15 as required by the width or nature of the fabric being knit. When more than one thread is being knit, it becomes necessary to separate them so that they will not become entangled. The device shown at 4 is a bracket, a number of which are used to support lines of wire along the machine for this purpose. At 8 is shown the end of the tension rod, which also runs the entire length of the machine. As the fabric is being knit it laps around this rod, and when the garments or stockings are finished the catch on drum is released and the roller is unwound, allowing the goods to unwind with ease. The machine can be started from any point by a rod which runs along the front in the most accessible place. The bracket shown at 9 supports this starting rod, one on each standard.

A thread carrier, as used on most English machines, is shown at 11, the point, 13, being a brass rod or tube to which the set of carriers is attached and also serving as a friction rod. The independent steel friction rod, as used on the American and most German machines, have in a great measure displaced the brass friction rod on account of its susceptibility to wear away by the constant sliding friction to which it is incessantly subjected.

At 12 is seen a hand wheel, its path of motion being always in the direction of the arrow. The slur bar, 14, is seen to better advantage in Fig. 20. The shafts are shown at 20, 21, 22, 23, 24, 27 and 28. These are mostly the fulcrums of motions already explained, and extend the whole length of the machine. The bearings through which these shafts run are situated on the standards and occupy the position shown in the drawing. This gives a bearing every two sections. The horizontal catch bar motion fulcrum, 20, is shown at W, Fig. 18. The driving shaft is shown at 21. This contains the fly wheel and driving pulleys, hand wheels, etc. The fulcrum, 22, of the up and down catch bar motion is shown in Fig. 19 at X. The fulcrum of the up and down needle motion is shown at 23 and can be plainly understood by referring to Figs. 7 and 14. The cam shaft, 24, and the narrowing machine shaft, 28, is also shown. The dotted circle, 30, indicates the large driven gear into which the smaller gear on the driving shaft is meshed. The large gear is secured to the cam shaft and imparts motion to the shaft in the direction indicated by the arrows.

(To be continued.)

A PIECE WORK SYSTEM FOR KNITTING MILLS.

BY RARITAN.

The best piece work system is found in those mills where all the operations of manufacture, winding of yarn, knitting of cloth, washing, dyeing, drying, cutting, seaming, covering, finishing, pressing, folding, boxing and packing, are paid for by the piece. Paying by the pound is equivalent to paying by the piece. Winding is paid for by the pound, the price varying with the size of the yarn and the number of ends or bobbins on the winder.

Knitting is also paid for by the weight of cloth, the price varying with the size of yarn used, the number of feeds on each machine, the number of machines an operator tends, and the speed of the machines.

Each mill can arrive at the price to be paid by taking the average production. A mill changing to piece work can allow for an increase of 20 to 25 per cent. in production.

This increase in production in knitting can be assured by the addition of a spare hand for every twelve machines. The increased production in knitting will more than pay for the cost of the spare hands, who are also available in case any of the regular hands are off duty.

Where the knitting is paid for by the pound, each roll of cloth is weighed, ticketed and recorded when cut and taken from each machine, so that the washer and dyer takes the weight from these tags as they are put into the washing machine, and the dryer gets his weights from the same tags, either as he is putting the rolls onto the machine to be dried, or when he attaches the tag to the roll as taken fully dried from the drying machine. The rolls of cloth are then taken

to the cutting room, and the cutting paid for by the dozen, that is to say, shirt bodies, sleeves and drawers.

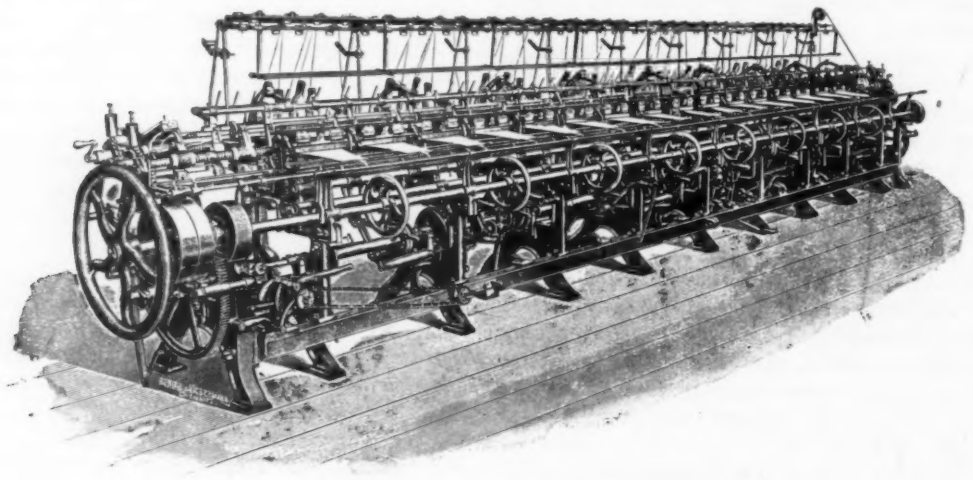
As a record is kept of the number of dozens of sleeves, shirts or drawers cut from each roll, with the name opposite the cutter, it is an easy matter to calculate the cutter's wages. Another way is have duplicate slips, with the name of the cutter on it, showing the quantities cut from each roll, one of the slips being attached to the goods going to the finishing room, and the other retained by the cutter, so that in case of errors in the office the cutter has his slips to prove the number of dozens he actually cut in a given period.

All the operations after the goods go from the cutter's room to the finishing room are paid for by the dozen. This is done by a duplicate coupon ticket. Each operator through whose hands they pass for the numerous operations of finishing, pressing, folding and boxing, cuts off the coupon from the ticket. These coupons are pasted into a book which has numbered spaces for each coupon, so that the coupons are very easily counted. When the pay roll is made up, these books are taken into the office, and all the leaves filled by coupons taken out and the book returned to the operator.

THE LUDWIG FULL FASHIONED HOSIERY MACHINE.

This hosiery machine for the Cotton full fashioned system of knitting is in extended use throughout Germany and for many years has demonstrated its high efficiency in respect to both large production and perfect goods. It is built at Chemnitz, Saxony, by H. Alban Ludwig and the representative in the United States is Louis Hirsch, 260 West Broadway, New York.

An important feature of the Ludwig machine is the improved narrowing motion by which the narrowing bars reach only as far as the center of the machine, being moved by four spindles. Thus the left half of the narrowing attachment is operated from the left side of the machine; and the right half, from the right side of the machine. In a sixteen section machine the narrowing attachment would operate eight sections from each side. One of the great advantages of this arrangement is the prevention of differences due to contraction and expansion of the machine parts. This is a difficulty that is very troublesome on the ordinary long machine, owing to the non-fitting of the narrowing points upon the frame needles. The usual remedy for this trouble is to stop work and wait until the temperature has



THE LUDWIG FULL FASHIONED HOSIERY MACHINE.

restored the machine parts to their normal condition. With the Ludwig narrowing attachment, however, this disadvantage has been entirely remedied and the machine can be started without loss of time.

Another valuable feature of the Ludwig machine is the internal cam movement. With the ordinary construction the levers are drawn towards the eccentric by powerful springs and at the high point of the eccentrics these springs are subjected to very high tension. The result is a very irregular strain on the springs, greater wear and an increased consumption of power. These difficulties increased as the number of sections on the machine grew larger. In the Ludwig machine these disadvantages have been remedied by the use of counter cams. The main lever is provided with a movable arm and the two lever arms are connected by a weak spring. In this way the spring is under a uniform and very slight strain, and the great amount of power required is no longer necessary, because for each high point there is a correspondingly low point on the counter cam, and the two rollers at the arms of the lever do not change their respective positions. This results in a quiet and uniform working of the machine, enabling good work to be done at much higher speed and a saving of from 25 to 30 per cent. of the power.

Further information regarding the Ludwig machine can be obtained from Mr. Hirsch.

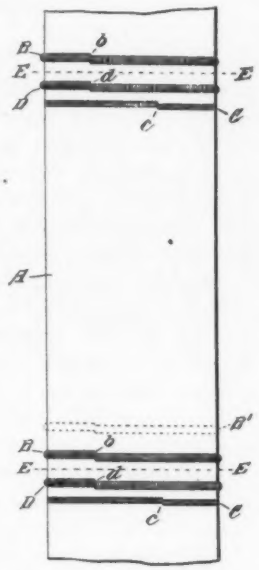
The total import of cotton yarn into Great Britain amounted to 243,031,067 lbs. in 1908 against 303,122,531 lbs. in 1907, a decrease of 60,091,464 lbs., chiefly marked in Indian yarn.

Owing to the abundant supply of water power from the mountain streams, North Carolina is much ahead of any other Southern state in her industrial expansion, and since June, 1909, 18 new cotton mills, 2 knitting mills and one miscellaneous mill have been erected. Within the same period 19 cotton mills and 16 woolen mills have been built in New England.

A TUBULAR RIBBED FABRIC.

A knit tubular fabric, recently patented in this country, is described by the inventor as follows: This fabric is a ribbed top or cuff such as forms part of men's half hose. It is customary to knit these rib tops upon a circular rib knitting machine provided with horizontal or dial needles and vertical or cylinder needles, and to provide each of the tops or cuffs with a welt at one end which serves as a selvage; and at the other end, a course of stitches the thread of which is more loosely drawn than that of adjacent courses, forming what is termed the "slack course," or "running-on" course.

These tops or cuffs are usually knit as a



A SECTION OF A CONTINUOUS RIBBED FABRIC.

continuous fabric or tube, a few courses being knit between the slack course of one top and the welt of the next adjacent course to permit of severing the individual tops or cuffs and to provide courses to be raveled when the top is applied to a knitting machine. The several tops are separated at a point between the slack course of one top and the selvage or welt of the adjacent course. The slack course of stitches is run on to the needles of a circular knitting machine, or upon the points of a transfer cup

or ring and subsequently transferred to the needles of the knitting machine, and the stitches beyond the slack course are raveled back to the slack course. The leg of the stocking is then knit directly on to the slack course of the ribbed top.

The operation of running on has been usually performed by hand, but recently machines have been devised for mechanically placing the cuffs or tops in such position that the stitches of the slack course can be engaged by transfer levers which are made to engage all or a portion of the stitches of the slack course and transfer them upon the points of a transfer ring or cup. These machines are provided with guiding and positioning devices which usually engage the depressions between the exterior ribs or wales of the fabric.

The continuous rib fabric has been fed to the transferring machine, expanded over a mandrel, and moved by the positioning devices to bring the slack course of a cuff or top into proper position, by the engagement of such positioning devices with the selvage or welt of the preceding adjacent top. This necessitates the retraction of the positioning devices to permit the fabric to be severed between the slack course to be run on and the selvage welt of the preceding top. Where the transfer levers are arranged to engage every stitch of the slack course, the positioning devices must be withdrawn sufficiently to clear the slack course entirely, as the positioning devices cover the alternate stitches of the slack course which are in line with the depressions between the exterior wales. The withdrawal of the positioning devices to permit the fabric to be severed and to permit the transfer levers to engage the stitches of the slack course has a tendency to disarrange the slack course and release it from the positioning means so that some of the transfer levers are liable to miss their stitches, and produce defective work in transferring the slack course to the transfer ring.

According to this invention, a tubular rib fabric is knit with the usual selvage welt, and the slack course of stitches. Between the selvage welts of one ribbed top and the slack course of the next top, an additional or special welt is knit for the purpose of serving, in conjunction with the positioning devices of the transferring machine, to position the slack course of stitches with respect to the series of transfer levers, and for other purposes hereinafter pointed out.

The web or fabric is severed between the selvage welt and the special welt, hence the positioning dvices do not have to be withdrawn from engagement with the special welt to permit such severing of the web. It is preferred to employ a series of transfer levers corresponding to every alternate stitch of the slack course, so that they may pass between the positioning devices, and engage the alternate stitches of the slack course while the fabric is still held. After the cuff or top is transferred to the transfer ring or to the needles of a knitting machine the special positioning welt is raveled out together with any courses intervening between it and the slack course and hence does not appear in the completed hose.

The accompanying illustration represents a section of continuous tubular fabric comprising a series of rib tops embodying the present invention. In the drawing, A represents the tubular ribbed web or fabric, provided at proper intervals with a selvage welt, B, and a slack course of stitches, C, arranged at suitable distances apart to form a ribbed top or cuff of the desired length. D represents the special welt, which as shown is knit between the selvage welt, B, and the slack course of the next top or cuff and at a sufficient distance from the selvage welt to permit the cuffs to be severed between the two welts and band, D, as indicated by the dotted line, E E. In some cases it is customary to knit more than one welt at the selvage end of the cuff or top, for the purpose of making a more ornamental effect, or to indicate the size of hose which is to be knitted thereon, and such an additional selvage welt is indicated in dotted lines at B^1, but such welts are always located between the selvage welt and the slack course of the same cuff or top and have nothing to do with the present invention.

RIBBED KNITTING OF MERINO YARN.

BY L. J. QUINN.

A great many knitters have trouble in plaiting yarns, and while a number of good kinks may be explained to the novice in this work, he will find that by actual test a multitude of things turn up that cannot be made clear in print. He must experiment for himself to quite an extent in order to be successful. The trouble most frequently encountered is the tendency of the cotton yarn to twist while the loop is being formed, this bringing the cotton yarn on the wrong side of the fabric. In using a fine count of yarn it is rather difficult at first sight to detect just what the trouble is, the cloth appearing streaky when held at certain angles to the light. Some may think that this is caused by an uneven stitch or by an uneven tension in pulling the yarn from the bobbin or cone, but the trouble will be found to be an improper adjustment of the tension on the worsted or merino yarn.

The knitter should see that the centre holes in the yarn guides are high enough to let the yarn form in a V from the needle where the stitch is being formed back to the guide hole. If the upper hole is not high enough it should be plugged up and another hole drilled a trifle higher and back toward the heel of the guide. When turning the machine by hand the worsted yarn will lie on the inside of the cotton or nearest to the dial, and on top of the dial needle. When the loop is formed the worsted yarn will turn on the outside of the fabric. When the machine is running the tendency of the yarn will be to flop on the dial needle for a few stitches, bringing the cotton yarn on the inside of the needle and consequently on the outside of the fabric. A button tension should be put on the worsted just as the yarn enters the guide hole. This will hold the plaiting yarn tight and the cotton cannot flop over it. Many knitters make the mistake of putting the tension farther back on the yarn on the bottom of the yarn rack or even higher up. It will be readily seen that the farther the tension is placed from the point where the stitch is being formed, the more liable the yarn is to breakage, as there will then have just so much more strain. On the other hand, if the tension is put on just outside the yarn guide, the danger of breakage will be reduced to the minimum. The Scott & Williams Knitting Machine Company at Philadelphia manufacture a tension which is simple and inexpensive, and can be attached to any yarn guide.

In knitting plaited material the dial cam ring should be moved ahead as far as possible and the dial needles should draw a longer stitch than on single-ply work. Care should be taken, however, to see that the dial needle does not draw a longer stitch than the cylinder needle. As the cylinder stitch is formed first the dial needle must rob from the loop of the cylinder stitch. If the dial draws more than the cylinder it is sure to cut holes.

Another thing that the knitter should not overlook in running worsted or merino yarn is keeping the yarn in a moist condition. The yarn should be kept in the basement or other cool place so that it cannot dry out. Worsted yarn will shrink 15 per cent. in weight if kept in a dry room for any length of time. The best method I have seen employed to keep the yarn in good condition was to dig a small ditch through one side of the basement and let all the waste water from the sinks and dyehouse flow through it into a drain. The yarn cases can then be piled up on either side and kept in good condition indefinitely without danger of mould or moths.

Another thing which will cause considerable trouble in running worsted or merino on counts as fine as 1/50s is the tendency of the loose fibres in the yarn that is being pulled from the bobbin, to twist around other fibres and cause a pull-up, or perhaps cut the yarn off where the stitch is being formed. This is a difficult thing to overcome and the cause will usually be found to be faulty spinning. This trouble can be reduced to quite an extent by running the yarn over a cloth saturated with a smooth oil.

The exports of flax from Russia in 1909 were over 225,000 tons more than in any of the three preceding years.

Dyeing, Bleaching, Printing, Etc.

DEVELOPMENTS IN THE BLEACHING PROCESS.

BY B. BOLD.

Modern bleaching, and especially that of raw cotton, has been developed in so many ways within recent years that it has practically succeeded in freeing itself from cloth-bleaching methods, and been strictly adapted to give to the fiber the physical and chemical properties required by spinners and other manufacturers of cotton.

The nature and form of raw cotton, and of the material to be produced from it determine the processes to be applied to it, and the machinery to be used. The Kuhn methods, developed in Germany by Alfred Kuhn, may be broadly divided into two classes: warm bleaching with boiling, and cold bleaching without boiling or steaming. These two classes are again sub-divided, and each class brought to perfection and made chiefly applicable to the bleaching of raw cotton, wool and cotton waste, card sliver, slubbing and rovings intended for spinning, yarn in the form of hanks, cops, cheeses and warp on the beam, raw cotton waste of every kind, including "linters" or short cotton seed fiber for conversion into chemically pure cotton cellulose, free from oxycellulose, for the manufacture of gun-cotton, smokeless powder, explosives, artificial silk, celluloid, etc.

The cold-bleaching system avoids the production of pure cellulose. It does away with boiling or steaming, which causes the absorption or saponification of the pectic or fatty and waxy constituents of the cotton fibers, and instead, in a very simple way, merely bleaches the fiber without altering its physical structure or deranging the form, sliver, etc., in which the material is subjected to the bleaching process. The loose cotton, as well as its products, cops or cheeses, enters direct into the bleaching apparatus, and is subjected to a bleaching process lasting from 1 to 1 1/2 hours, according to the nature of the material being treated. It is then washed out in the same apparatus, and in about two hours removed, passed to the hydro-extractor, and then dried. Since the natural fat and wax of the fiber are not extracted by this bleaching process, the spinning qualities of the bleached fiber are claimed to be exactly the same as those of the raw material. Although a full white is obtained, the loss in weight through bleaching is sensibly reduced. American cotton is said to lose only 3 per cent.; Bengal, 5.4 per cent.; and Adana, 4.8 per cent., by weight.

The bleaching material consists of a combination of hypochlorites of alkalies and oil preparations, with a characteristic peculiarity of rapidly becoming moist, so that the bleaching liquor not only touches the surface of the fiber, but in a very short time penetrates into the finest pores and hollow spaces, in which the colored impurities of the fiber are chiefly situated, serving also as a conductor of oxygen, and effecting thereby an energetic oxidation of the impurities under a most gentle treatment of the fiber.

On account of the excellent capillary action of the bleaching liquor, and the simplicity of the process, no complicated apparatus, such as the vacuum apparatus, is necessary, one man only being required to attend to a complete installation of two or more machines, each of them producing about four charges of 90 to 100 lbs. each per day of ten working hours.

The advantage of this system over existing so-called "cold bleaching" methods is claimed to lie in the quality of the bleached material, which, no matter how long it is kept in stock, retains its full white color and original strength. Material bleached by other methods, without boiling, often turns yellow in stock and becomes brittle, because sour chloring or free gaseous chlorine is generally used. Such treatment, besides reducing the strength of the yarn and the degree of whiteness obtained, being unavoid-

ably accompanied by a strong formation of oxycellulose.

The leading principle of the warm bleaching method is likewise the production of an absolutely pure, full, white product, by means of simplified and shortened processes, with reduced bleaching costs, since a considerable saving is effected in bleaching materials and in manual labor, as well as in diminished loss of weight in bleaching. These warm bleaching systems have been carefully thought out, and are being worked on a very large scale with low cotton waste containing a great deal of adherent shell and other impurities, and intended for spinning purposes for gun-cotton and for surgical cotton wool. The results obtained by the Kuehn process compare favorably with other methods as regards all the essential properties of the material in process of manufacture.

The raw material, be it cotton wool or waste, is first mechanically cleaned in the usual way by willowing, and is then blown through a trunk into a specially constructed boiling kier, which is fitted with a special filling or depositing apparatus, consisting of a sprinkler arrangement producing a shower of spray which meets the flocculent cotton as it enters, and rapidly penetrates and moistens it, causing it to deposit itself upon the perforated false bottom of the kier. The surplus liquid flows back to the reservoir containing the spraying liquor, which is continually circulated through the spray diffuser by means of a special pump, the rate of circulation being easily regulated. In this way about 2,000 lbs. of raw cotton may be automatically filled-in in half an hour, being damped down and reduced in volume to such an extent that it may be contained in a kier about 6 ft. 7 in. in diameter and height, lying close and evenly. The filling apparatus is then removed and replaced by a perforated lid and an internally fitted cover, so that the wet cotton is firmly enclosed between two perforated discs, with the result that no flocks of fiber can be carried away by the circulating of the preparatory and boiling liquors, thus avoiding loss of material and danger of stoppages in the pipes and valves, or clogging in the circulating apparatus. The circulation of the preparing liquor thus produces absolute penetration, causes the material under treatment to give up a good deal of the impurities adhering to it, opens it and softens it, and thus prepares it in an economical manner for the subsequent boiling operation. Boiling is accomplished in the same, but now hermetically closed, kier, under high pressure, with fresh compound alkaline lye in conjunction with a special oil preparation, the air still contained in the cotton having first been driven out by an automatic arrangement.

Owing to the perfect preparation process, and to the special construction of the kier, a five to six-hour boil, depending upon the nature of the material under treatment, is sufficient, and is followed by a direct washing-out in the same kier. All particles of shell, leaves, straw and other impurities are entirely destroyed by the boiling process.

A transporting arrangement, electrically driven, then carries the boiled cotton into a second kier, a bleaching and neutralizing apparatus of simple construction, but provided with a characteristic circulating arrangement. The bleaching bath acts on the material without pressure for two hours only, the liquor consisting in a perfect solution of chloride of lime (or sodium hypochlorite or electrically produced bleaching liquor). Owing to the preceding thorough preparation and boiling, it is only necessary to keep the strength of the bleaching liquor at about 0.5 Be., equally 0.2 per cent. of active chlorine.

The bleaching bath is followed by a thorough rinsing, souring for one-half hour and then a thorough washing-out in the same apparatus, without removing the material. One man is sufficient to watch all the operations of preparing, boiling and bleaching.

From the bleaching apparatus the cotton falls into a receptacle which forms part of the rinsing machine, the latter being provided with an automatic discharge to the hydro-extractor, which with the wet cotton opener and the drying machine, forms a well-arranged set of finishing operations in which the manual labor for the transport of

the material is entirely eliminated. All the working parts of these machines are carefully protected against rust or oxidation.

Fiber treated in this way is said to be chemically pure, quite white, absolutely free from oxycellulose and particles of shell, and is highly hygroscopic.

As regards the production of absorbent cotton wool for surgical purposes, the mechanical operations and transport of the material, which are a feature of Mr. Kuehn's system, lend themselves particularly well to the production of a sterilized product. Cotton wool produced by this system meets the requirements of the British pharmacopoeia and of the war department.

Below I give the results of an analysis of chemically pure cotton cellulose ready for nitration and produced as described, this analysis having been made by the Laboratorium fur Technischwissenschaftliche Untersuchungen, at Neubabelsberg, Germany:

American cotton waste: Fat, 0.11 per cent.; ash, 0.10 per cent. Indian cotton waste: Fat, 0.06 per cent.; ash, 0.07 per cent.

Mr. Kuehn's warm-bleaching process for cotton wool and for cotton waste for spinning, surgical and nitration purposes, is claimed to possess the following advantages over other bleaching methods: An improved boiling process in a specially constructed boiling kier, with compound alkaline lye and oil preparations of high capillary capacity and constant degree of concentration, and with a previous special preparation in the same apparatus; a short boiling and bleaching process, completed in a working day of from 9 to 9 1/2 hours; bleaching by means of a weak bleaching liquor, thus avoiding all danger of over-bleaching and the formation of oxycellulose, while preserving to the fullest extent the natural spinning quality of the fiber; considerable saving in labor and in bleaching materials; simple and cheap work, absolute safety and great efficiency.

In 1840 there were 32,000,000 head of sheep in France, whereas on January 1, 1907, the number had fallen to 17,000,000.

ON THE PROPER SELECTION OF STOCK FOR MERCERIZED YARNS.

By J. MERRITT MATTHEWS, Ph. D.

A very important factor in the production of mercerized yarns of the highest quality is the proper and intelligent selection of the raw cotton to be employed. In the early days of the mercerizing process it was thought that the long-stapled Sea Island and Egyptian cottons were the only varieties which could be mercerized with any degree of success. In fact, the chief basis on which the claims of the once celebrated German patent of Thomas and Prevost were built up was in the definitive use of Egyptian cotton. As an exclusive basis for the mercerizing process this was generally recognized as untenable, and led to the final revocation of this patent. In Germany to the present day, however, although a very large amount of mercerized yarns is produced, Egyptian staple is almost exclusively used. In England, where mercerizing is also carried on in a large degree, both Egyptian and Sea Island cottons are used. In neither Germany nor England is American peeler cotton employed for the manufacture of mercerized yarns.

In this country, however, although the highest grade of mercerized yarns are made, of course, from Egyptian and Sea Island stocks, yet a very large amount of peeler yarns are mercerized, and are in good demand by the trade. Nor is the product obtained by the use of peeler cotton to be lightly dismissed as totally unworthy of comparison with that produced from Egyptian and Sea Island cottons. By careful preparation and treatment peeler yarns may be mercerized so as to possess a luster and softness closely approximating these qualities in the longer stapled cottons. The strength, of course, of the peeler yarn is considerably below that of yarns prepared from Egyptian and Sea Island fibers, but the immediate point which it is desired to emphasize is that yarns prepared from peeler stock may be successfully mercerized, and that the product is in large de-

mand in this country where a lustrous yarn is required of medium quality.

From a consideration of the intimate nature of the mercerizing process, it will be comparatively easy to understand the character of staple which should be selected in order to obtain the best results. For this purpose it will be necessary to possess a clear conception of the effect of mercerizing on the individual cotton fiber. Anyone familiar with the properties of the cotton

FIG. 1. FIG. 2. FIG. 3.

fiber is aware of the fact that this fiber in its general structure resembles a long tube the walls of which have collapsed so as to produce a flat, rather thick, ribbon-like form, which is more or less twisted on itself, sometimes in one direction and sometimes in the other. This gives rise to the familiar microscopic appearance of the cotton fiber.

Fig. 1 represents a regularly developed, fine-stapled fiber very evenly twisted and showing no irregularities of development. Such a structure is more or less the ideal desired in a cotton fiber. In the better grades of Egyptian and Sea Island varieties a large proportion of the fibers correspond more or less to this structure, while with the average American peeler cottons the proportion of these perfect fibers is much smaller. Fig. 3 represents a portion of a fiber corresponding to another type of structure; the general fiber is coarser and thicker, and the cell-walls are more rigid and more irregularly shaped. The twists are by no means regular or frequent, and irregularities of development are constantly encountered. This type of fiber occurs to a considerable extent in the usual American varieties, and to a less degree in Egyptian and Sea Island cottons.

The caustic soda employed in mercerizing combines with the hardened cellulose of the cotton fiber in such a manner that the fiber swells up so as to alter its flattened form to a more or less rounded one. Owing to this swelling-up, the twists in the fiber are eliminated to a considerable degree, though leaving more or less prominently their markings still on the fiber, owing to an incompleteness in the lateral expansion of the cellulose mass. This structure is shown in Fig. 2. If the mercerization were ideally perfect the fiber would swell up evenly to a regularly proportioned cylinder or rod. As the fiber swells up laterally, if it be maintained in a state of tension longitudinally, thus preventing shrinkage in that direction, the external layer (or "skin") of the cell-wall becomes distended so as to produce a smooth surface; and this, reflecting light in a regular manner, gives the characteristic lustrous appearance of mercerized cotton.

When the original fiber possesses a regular structure, as shown in Fig. 1, the surface of the mercerized fiber will be correspondingly regular. If, however, the original fiber presents irregularities of structure, the mercerized fiber will not possess as smooth and regular a surface; hence its luster will not be as high.

As already pointed out, it is necessary

that the fiber be maintained in a state of tension lengthwise in order to attain the condition required for the production of a smooth surface. It is easy to understand that the longer the fiber the more readily can this tension be applied, and to a proportionally greater degree under the actual conditions to be met with in practical work. The tension cannot be applied directly to the individual fibers themselves, but to the yarn which is made up of a large number of these fibers twisted together. Therefore, the long-stapled fibers are better adapted for mercerizing with respect to this condition than those of shorter staple. This condition will also be better realized if the fibers of which the yarn is composed are uniform in length.

We thus see that the selection of the proper stock for mercerized yarns should be based on two main principles:

(a) The fibers should possess an even structure with as small a percentage of irregularities as possible, so that after swelling the external surface may be as smooth as possible.

(b) The staple should be as long as possible consistent with evenness of staple.

The higher grades of Sea Island cotton fulfill these conditions better and more uniformly than any other variety of fiber. Owing to the restricted supply, high price, and other uses to which this fiber is alone adapted, the amount of such cotton available for mercerizing is not very great. Next to Sea Island the Egyptian cottons are most highly prized for mercerizing, but as there are now a number of different varieties of this cotton brought upon the market, care must be taken to give them proper selection. Among American cottons there are some varieties which are far superior to others with respect to the conditions given above. Allen-seed cotton and other limited varieties of the same character of staple are well adapted for mercerizing, they having a fine staple and regular structure. Hence there is the "silkiness" of the fiber, coupled with a length of staple greater than the average for ordinary American cottons. The chief defect in this cotton, however, is its rather uneven length of staple, which necessitates cautious combing and spinning in order to produce a satisfactory yarn. By the use of Allen-seed cotton, however, mercerized yarns may be obtained possessing almost as high a degree of luster as that given by yarns made from the average grades of Egyptian cotton.

The special selection of American cottons for mercerizing is still in a comparatively undeveloped stage. Likewise the selective cultivation of these cottons with their use for mercerizing in view has received very little, if any, consideration.

MODERN DYEING CONDITIONS

BY. J. DOBROYD.

From the Dyer and Calico Printer.

Much less wool is dyed in the loose wool state than formerly, while there is considerably more rag and piece dyeing in addition to that of slubbing. Wool dyers have quite different features to contend with to the dyers of cloth, and these again are faced with difficulties from which the slubbing, yarn, and rag dyers are exempt. Unevenness of color which is such a bugbear to piece dyers is of little moment in dyeing loose wool, since this is remedied in the carding and spinning. Slubbing, like loose wool, is rarely even in shade when it leaves the dyer, but recombing distributes this and gives solidity of shade. Chief among the faults which the slubbing dyer has to avoid is the matting or felting of the material. Prolonged boiling is out of the question, and if the shade has not been obtained it is a safer course to dye up a fresh batch to correct the first.

Slub dyeing machines may be divided into two classes, those in which the material is stationary and the liquor circulates, and others in which the slubbing is in motion. Open pans are in favor for small lots, particularly where the shade required is bright; these naturally can be kept much cleaner than a machine. Colors on slubbing are supposed to be reasonably fast to light and also to milling, but both are only so in the comparative sense.

Dark colors and sober slates, drabs, and such like shades are the fastest to light while as the shades increase in brilliancy the fastness decreases in something the same proportion. Alizarines are the standard dyes to depend upon for permanence, but a drawback to their use is that they are dyed at the actual boil, and also that it takes considerable time to exhaust the bath. Both these features are against their use for slubbing, as the dyer is required to keep the material free, open, and lofty, while recombing may cause a great waste.

The term alizarine now covers a very large body of coloring matters, many of which are by no means fast to both light and milling. The earlier brands of alizarines of the insoluble class are faster than the more recent soluble powders which are included under the heading of alizarine, but there is a great temptation to use a more fugitive topping color to impart brightness to the shade.

Unfortunately in the slubbing trade, the dyer, comber, spinner and manufacturer are never in close enough touch with each other, and consequently know little of the difficulties which each has to contend with. As a case in point, the finisher of a fancy mixture should know enough of the dyer's craft to appreciate the fact that certain colors will stand good soap and carbonated alkali, but will not be proof against bleeding when strong soap or caustic soda ash is used.

Commercial indigos are having a good run at the present time for low and middle class cloths, due to the feeling among the merchants against ordinary blues. Genuine indigo from the natural dye, and put on by a fermentation vat, is without doubt the richest and fastest blue known, but the cheap imitations of it have little to recommend them but the name. Both the color makers and the dyers are free from all blame. (To be continued.)

The exports to the United States from Huddersfield during February, 1910, amounted to $131,687, as compared with $226,024 in 1909. The shipments of wool goods amounted to $19,900, an increase of $9,725 over the same period in 1909.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 81.

Black on Cotton Yarn.

Sulphur Black B X Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

7½ lbs. Sulphur Black B X Conc.
(Read Holliday & Sons, 11 Gold St., N. Y.)
15 lbs. Crystalline Sodium Sulphide.
10 lbs. Common Salt.

Enter the boiled-out yarn at the boil, and then work for one hour without steam.

Sulphur Black B X Conc. possesses good leveling properties.

Recipe No. 82.

Orange on Worsted Yarn.

Milling Orange No. 88 on 100 lbs. worsted yarn. Prepare the dye bath with

1½ lbs. Milling Orange No. 88.
(F. E. Atteaux & Co., 176 Purchase St., Boston, Mass.)
10 lbs. Glauber's Salt.
4 lbs. Acetic Acid.

Enter at 140° F., and dye at a boil for one hour. Then add

5 lbs. Bisulphate of Soda

and boil until the bath is exhausted. Then cool and add

2½ lbs. Potassium Bichromate

and boil 3/4 of an hour longer.

Milling Orange No. 88 possesses excellent fastness to milling and light.

Recipe No. 83.

Black on Worsted Yarn.

Fast Acid Black N on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Fast Acid Black N.
(C. Bischoff & Co., 451 Washington St., N. Y.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 160° F., and dye at boil for one hour.

Fast Acid Black N is a very level dyeing color, and may even be entered at the boil if desirable.

Recipe No. 84.

Yellow Olive on Cotton Yarn.

Immedial Yellow Olive 5 G Pat. on 100 lbs. cotton yarn. Prepare the dye bath with

8 lbs. Immedial Yellow Olive 5 G.
(Cassella Color Co., 182 Front St., N. Y.)
8 lbs. Sodium Sulphide, Crystals.
4 lbs. Soda Ash.
40 lbs. Glauber's Salt.

Enter at 180° F., and dye at a temperature just below the boil for one hour.

Immedial Yellow Olive 5 G possesses excellent fastness to light, and very good fastness to washing.

Recipe No. 85.

Blue on Cotton Yarn.

Brilliant Congo Blue 5 R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Brilliant Congo Blue 5 R.
(Berlin Aniline Works, 213 Water St., N. Y.)
40 lbs. Glauber's Salt.
2 lbs. Soda Ash.

Dye for one hour hour at a temperature just below the boil.

Brilliant Congo Blue 5 R possesses fastness to light and weather somewhat better than the ordinary substantive blues, and its fastness in other respects is equal to or better than other direct cotton colors.

Recipe No. 86.

Green on Cotton Yarn.

Nerole Green G G X on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Nerole Green G G X.
(Innis, Speiden & Co., 46 Cliff St., N. Y.)
25 lbs. Common Salt.
1 lb. Soda Ash.

Enter at 180° F., and dye at a boil for one hour.

Nerole Green G G X possesses the characteristic properties of the direct cotton colors.

Recipe No. 87.

Blue on Worsted Yarn.

Acid Chrome Blue 3 G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Acid Chrome Blue 3 G.
(Farbenfabriken of Elberfeld Co., 66 Lafayette St., N. Y.)
20 lbs. Glauber's Salt.
3 lbs. Acetic Acid.

Enter at 140° F., bring slowly to a boil and dye at a boil for 1/2 hour. Then add

2 lbs. Sulphuric Acid

and boil for one hour longer. When the dyestuff is exhausted add

1½ lbs. Potassium Bichromate

and continue the boiling for 40 minutes.

Acid Chrome Blue 3 G possesses very good fastness to light, washing, alkali, perspiration, rubbing and good fastness in other respects. It leaves white cotton effect threads untinged, as well as scarcely affecting white silk threads.

Recipe No. 88.

Blue on Union Dress Goods.

Tetrazo Union Navy Blue on 100 lbs. union dress goods. Prepare the dye bath with

4 lbs. Tetrazo Union Navy Blue No. 31,393.
(American Dyewood Co., 84 William St., N. Y.)
30 lbs. Salt.
2 lbs. Sal Soda.

Enter at 160° F., and run for 1/2 hour. Bring slowly to a boil and boil 1/2 hour, or until the full richness of the color is developed on the wool. Turn off the steam and run for a further half hour. Then rinse.

Tetrazo Union Navy Blue No. 31,393 colors the wool and cotton fibers well, and produces an especially pleasing shade of rich navy blue on union goods.

Recipe No. 89.

Brown on Cotton Yarn.

Oxamine Brown G N on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Oxamine Brown G N.
(Badische Co., 128 Duane St., N. Y.)
20 lbs. Glauber's Salt.
1 lb. Soda Ash.

Enter at 180° F., and dye at a boil for one hour.

Oxamine Brown G N produces brilliant orange brown shades which possess comparatively good fastness for a direct cotton color.

Recipe No. 90.

Black on Cotton Yarn.

Chlorazol Black E Extra Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Chlorazol Black E Extra Conc.
(Read Holliday & Sons, 11 Gold St., N. Y.)
25 lbs. Common Salt.

Enter the goods at a boil and boil for one hour.

Chlorazol Black E Extra Conc. possesses good fastness to light.

Recipe No. 91.

Violet on Cotton Yarn.

Immedial Violet C B on 100 lbs. cotton yarn. Prepare the dye bath with

7½ lbs. Immedial Violet C B.
(Cassella Color Co., 182 Front St., N. Y.)
15 lbs. Sodium Sulphide, Crystals.
4 lbs. Soda Ash.
50 lbs. Common Salt.

Dye at a temperature just below the boil for one hour.

Immedial Violet C B gives a bright shade of violet which possesses good fastness.

Recipe No. 92.

Blue on Cotton Yarn.

Diazo Navy Blue G on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diazo Navy Blue G.
(Geisenheimer & Co., 189 Front St., N. Y.)
5 lbs. Soda Ash.

Enter at 180° F., and dye at a boil for one hour. Then rinse and work for 20 minutes in a cold bath made up with

2.5 lbs. Sodium Nitrite,
7.5 lbs. Hydrochloric Acid, 32° Tw.,

and then develop by working 20 minutes longer in a cold bath made up with

1 lb. Beta Naphthol

dissolved in a small amount of caustic soda solution, and added to the necessary amount of water.

Diazo Navy Blue G when diazotized and developed possesses very good fastness to washing and does not bleed.

Recipe No. 93.

Black on Union Dress Goods.

Tetrazo Union Black No. 31,394 on 100 lbs. union dress goods. Prepare the dye bath with

6 lbs. Tetrazo Union Black No. 31,394.
(American Dyewood Co., 84 William St., N. Y.)
30 lbs. Salt.
2 lbs. Sal Soda.

Enter at 160° F., and run for 1/2 hour. Bring slowly to a boil and boil 1/2 hour, or until the full richness of the color is developed on the wool. Turn off the steam and run for a further half hour. Rinse.

Tetrazo Union Black No. 31,394 colors the wool and cotton fibers well and produces a full bloomy shade of black on union goods.

Recipe No. 94.

Blue on Cotton Yarn.

Dianil Brilliant Blue 6 G on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Dianil Brilliant Blue 6 G.
(H. A. Metz & Co., 122 Hudson St., N. Y.)
20 lbs. Common Salt.
½-1 lb. Acetic Acid.

Dye just below the boil for one hour.

Dianil Brilliant Blue 6 G is characterized by its extreme brilliancy and simple method of application.

Recipe No. 95.

Blue on Worsted Yarn.

Fast Acid Blue B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Fast Acid Blue B.
(C. Bischoff & Co., 451 Washington St., N. Y.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 160° F., and dye at a boil for one hour.

Fast Acid Blue B is a very level dyeing color and may even be entered at a boil if desirable.

Recipe No. 96.

Black on Worsted Yarn.

Biebrich Alizarine Black 4 N E Conc. on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Biebrich Alizarine Black 4 N E Conc.
(Kalle & Co., 530 Canal St., N. Y.)
6 lbs. Acetic Acid.

Enter the yarn at 140° F., bring to a boil and dye at a boiling temperature for 3/4 of an hour.

No Sulphuric Acid need be used as the black exhausts completely with Acetic Acid. If Sulphuric Acid is used the quantity should be small and a large amount of Glauber's Salt should be used with it.

Biebrich Alizarine Black 4 N E Conc. possesses good fastness to light and weather, rubbing, perspiration and hot pressing.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Picking Machinery. The R. I. Elevator & Machine Co., Providence, R. I., have commenced the manufacture of picking machinery under the management of A. T. Atherton, well known in connection with this class of cotton machinery. The R. I. Elevator & Machine Co. have entirely discontinued their elevator business and the plant will now be given over to the manufacture of picking machinery, which will be of the same type and model as that manufactured heretofore by Mr. Atherton.

Watchman's Portable Clock. Hardinge Bros., 3133 Lincoln Ave., Chicago, Ill. An improved portable clock for watchmen, an account of which appears in this issue.

Yarn Dyeing Machine. Ed. Esser & Co., Goerlitz, Germany. An improved machine for dyeing yarn in skeins. It operates on the circulating system, the liquor being forced through the material by a pump.

Grinding Cards. G. Josephy, Bielitz, Austria. A traverse grinder for cards to take the place of what is known as the hand fiddle by which carders give the finishing touches in the grinding process.

Carbonizing Cloth. Rheinischen Webstuhl & Appreturmaschinenfabrik, Duelken, Germany. An improved machine for carbonizing pieces. It is in successful operation in German mills and embodies a number of important features for the increase of production and improvement in the work.

Cloth Printing Machine. Messrs. B. Buffaud and T. Robatel, Lyon, France. An improved machine for printing fabrics in short lengths. A description appears in this issue.

Thread Guide. Joseph Appleby, Birmingham, England. An improved metal thread guide for ring spinning and twisting frames.

Electrolytic Bleaching. Ernest Grether, Manchester, England. An improved apparatus for electrolytic bleaching. It is claimed to effect important economies in labor and material as well as to give good results in the character of the bleach.

Shuttle Holder. Lorenz Strobel, Hittnau, Switzerland. An attachment for preventing the rebounding of the shuttle in the loom box.

Shuttle Threader. Franz Sameck, Zurich, Switzerland. An improved shuttle in which the thread is passed through a slit into the eye of the shuttle, which is so arranged as to prevent the thread from coming out during weaving.

Yarn Drier. E. Delemarre & Co., Roubaix, France. An improved hot air drier for slashers.

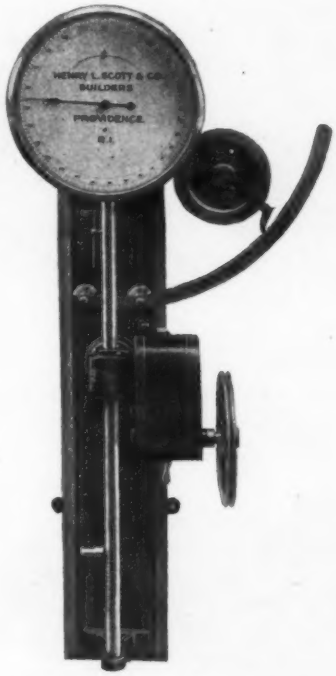
Cloth Beam. A. Barton & Sons, 36 Pine St., Bury, England. An improved cloth beam that has been designed to stand hard usage such as is incident to transportation between mills.

Wool Card. John Hetherington & Sons, Manchester, England. An improved wool card which is in successful use in a number of English mills.

Vacuum Extractor. Ernest Gessner, Aue, Germany. An improved machine for extracting water from textile fabrics. By means of a vacuum a strong suction is maintained through the fabric as it passes through the machine.

STRENGTH TESTING.

Accurate and uniform results in testing tensile strength of cloth and yarn can only be obtained by using machines whose action will be the same in different tests. Without uniform motion large variations may occur in the testing of similar materials. It is there-



A TESTING MACHINE FOR CLOTH ON YARN.

fore of great importance that the moving members holding the material have a steady motion.

Henry L. Scott & Co., Providence, R. I., have recently brought out an automatic gear box for attachment to their testing machines that obviates this difficulty and insures uniform tests by making the operation of the tester automatic. The mechanism is very simple and free from delicate parts and adjustments. The return is double the speed of the break, thereby making the tester very rapid in operation. The drive is made with 1/4 inch round belt, showing how little power is required to operate it. A small lever on the box starts the mechanism. The machine then runs the clamp holding the material the entire length of the stroke, where it reverses and returns to the starting position automatically. No skill is required to make perfect tests, nor can manipulation vary the results, as the machine cannot be interfered with while a test is being made.

This firm has given great attention in the past ten years to the development of building testing machines and the experience gained has resulted in numerous improvements. Another recent development is a clever resetting device which, when used in conjunction with their power attachment, makes perfect testing a simple matter. They always carry in stock a line of standard testing machines for various purposes from which they can make quick delivery and will undertake at any time to build special machines designed for unusual requirements.

PATENT SELF-SHARPENING SCRIMP RAIL.

Cotton dyers and finishers will be interested in a new patented device for smoothing ing creases and curled selvages, recently invented in England by Harry Hadwin.

Every practical man who handles cloth knows how much trouble a curled selvage will cause: the dyer finds it in light colored selvages; the starcher in streaks; and the calender man in the cutting of his goods and the rapid deterioration of the rolls. In fact, there is so much annoyance and trouble caused by wrinkles and curled selvages that it would take more space than we can give to recite all of them, but to the man who is "up against it" they will all too readily suggest themselves.

Many devices have been put on the market to obviate these troubles, which have proved more or less satisfactory. One of the best and most practical of these devices for curled selvages is the scrimp rail; this has been found to do the work all right when in good sharp condition, but the trouble has been to keep it sharp.

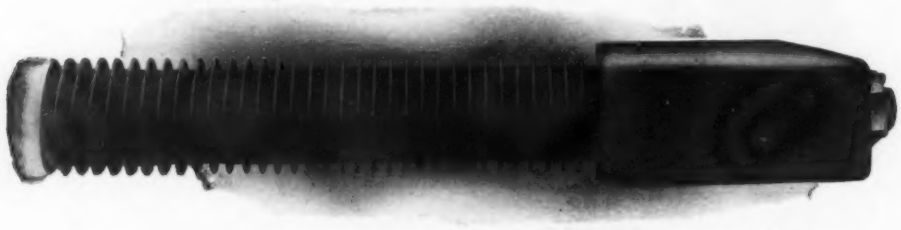
The new form of scrimp rail, as may be

seen from the accompanying illustrations, is composed of a rigid bar, which may be of any desired length, having solid metal pieces with tightening nuts at either end. Threaded on to the bar are a number of discs, oval in shape and made of noncorroding metal; between each pair of metal discs is a fiber distance piece of the same length as the metal disc, but rather narrower. When, therefore, the discs and distance pieces are threaded on to the rod, the former will project at the sides but not at the edges of the completed rail. The central distance piece is of V shape, so that the discs on either side are inclined—the one-half in one direction, the other half in the opposite direction; while the distance pieces being all of the same thickness, the metal discs are equally spaced and exactly parallel.

The advantages which are claimed for this new construction of scrimp rail are:

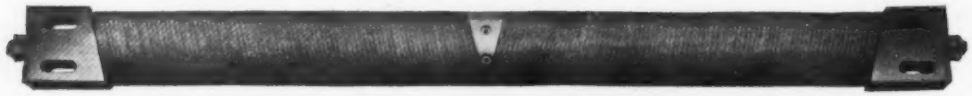
SHOWING BLADES AND FIBER DISTANCE PIECES.

The working edges of the metal discs are kept constantly sharp so long as there is any metal left to act on the fabric, thus there is no necessity for resharpening.



A SELF-SHARPENING SCRIMP RAIL.

The rail is thus always kept at its maximum efficiency, and is, therefore, more reliable and effective than the old solid type.



SHOWING COMPLETE SCRIMP RAIL.

The rail is built upon a scientific principle, and gives the best possible grip on the cloth.

Both sides are precisely similar; the rail

The rail is built up of numerous component parts, any of which can be readily replaced, when worn out or in case of damage without it being necessary to discard the whole rail.

It can be used for either dry or wet fabrics without any risk of their being marked by any stains or rust.

This patent scrimp rail has met with such favor in England that Messrs. Mather & Platt, Ltd., Manchester, Eng., the foremost builders of textile finishing machinery in the world, have secured the European rights, while the Arlington Machine Works of Arlington Heights, Mass., have secured the American rights.

The Arlington Machine Works will be glad to send a sample rail to any mill in this country, and have so much confidence in it that they will send it subject to approval.

THE WILCOMB SPRING NEEDLE KNITTING MACHINE.

This machine is built by the Wilcomb Machine Co., Norristown, Pa., to meet the demand for a machine capable of a large production of underwear, rubber linings, stockinette, jersey cloth and similar goods. It embodies the well known European sinker and spring needle principles along with the latest improvements of American machines. The builders believe that this is

THE WILCOMB SPRING NEEDLE KNITTING MACHINE.

the simplest knitting machine ever produced. No burr wheels are employed on the Wilcomb machines, there being spring needles, sinkers and eveners that divide the loops. The needles require no truing up. Even stitches are made with slightly crooked needles. Holes and run-offs do not damage the needles, sinkers or other parts of the machine. No hand work is required in the event of holes several inches wide or complete run-offs. The yarn is put in the thread carrier, the power applied and good rows of knitting are produced at once.

The machine works equally well with one feed or with all the feeds, and any number of them may be cut out in two seconds. All the feeds may be adjusted simultaneously for tight or loose knitting, or each feature may be adjusted separately.

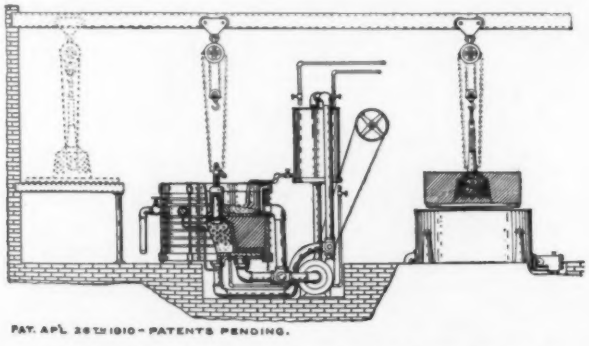
The relative working positions of operating devices for needles, sinkers, presser, knocking over and dividing are non-adjustable. The machine may be taken apart and reassembled by a fixer without affecting a single adjustment, and from the first row of knitting the fabric is exactly like that made before taking the machine apart. Special attention has been given to the take-up which will handle varying thicknesses of fabrics with uniform pull on the needles.

An automatic winding roll is adjustable for a tight or loose wind. The take-up and roll are operated independently and are not necessary to make a good fabric, as the machine knits equally well without weight or take-up on the goods. All the rotary parts of the knitting head run in oil; the needles and jacks may be slushed with vaseline or heavy oil without danger of spotting the fabric.

This machine was shown in operation at the recent knitting exhibition at Philadelphia and attracted general attention and much favorable comment.

A NEW DYEING MACHINE.

We have recently had the opportunity of inspecting the workings of a new dyeing machine adapted to all textile fibers and for any of the various groups of dyes. The machine, which is patented, is the invention of Jan Tadeusz Psarski, and is built by The Beckman Company of Cleveland, Ohio.



THE NEW PSARSKI DYEING MACHINE FOR ALL TEXTILE MATERIALS.

The dye kettle proper is made of heavy pine, and cylindrical in shape, securely bolted to a heavy cast iron top and bottom. Fitting into this kettle is an iron or copper false bottom, constructed with a central cone-shaped portion, supplied with a number of perforations, so as to permit thorough distribution of the dye liquor.

A removable cover, also of iron or copper, and supplied with few and very small perforations near the periphery, fits closely to the inside of the kettle, and is securely held in position by a central spindle, which serves as a bolt, and side clamps to hold the false bottom and cover together.

A rotary pump is attached to the kettle, and by suitable pipes and valves the dye

liquor is made to circulate through the mass of material to be dyed, and when the dyeing is completed, to force the spent dye liquor back into the stock tank to be replenished. The pump also serves to force the rinsing water through the machine.

To commence dyeing, the false bottom is lowered into its place and the material to be dyed carefully packed around the central perforated cone or distributor, after which the cover is placed in position and tightly clamped down. The dye solution is then allowed to flow in from the dye tank, the pump put in motion, and the circulation continued until the dyeing is completed.

The temperature is maintained or regulated by means of a closed steam coil in the machine, in the space immediately under the false bottom.

After dyeing the dye liquor is withdrawn by the pump and forced into the stock tank, and the water is circulated and continued until the washing is completed, after which the chemical solutions are circulated as in the case of diazotizing and developing. When the final washing is completed the cover is removed, and by means of an overhead block and chain the false bottom is removed, carrying the dyed material, the whole being lowered in a whizzer.

One of the advantages of this machine is the very small volume of dye liquor in use, there being but 250 gallons of liquor for 500 pounds of material to be dyed, or in the proportion of 1 to 4.15 by weight. Owing to this small volume the circulation is very rapid, the entire quantity being circulated about twice per minute.

One of the important points noticed in making dyeings with this machine is the automatic prevention of channels in the stock during the dyeing, and which is due to the constant upward and outward flow and pressure of the dye liquor. The pressure of the dye liquor may be as high as 25 pounds per square inch, and where so high a pressure is secured there seems to be no possibility of channels and consequently no uneven shades.

The machine is so constructed so as to be useful for all kinds of material, such as cotton and wool, raw stock, skeins, cops, cones and rags, and is available for stripping, chrome-mordanting and dyeing with any class of colors.

From our observations we are inclined to regard the machine as being quite economical, the small volume of dye liquor requiring but a small quantity of steam to maintain it at the boiling temperature; one laborer only is required to handle 2,000 pounds of cotton per day. The stock to be dyed not being handled after the machine is closed, no impairment of the fiber can occur. A machine of 500 pounds' capacity requires less than 50 square feet—exactly 6 1/2 by 7 1/2 feet.

As a time saver, the following abstract of records of actual dyeings has been made:

Oily Rags—Stripping, Chroming and Dyeing.

(500 pounds).

	h.	m.
Scouring with alkali		.10
Washing out		.30
Stripping with hyraldite		.15
Rinsing		.30
Chroming	1	.15
Dyeing	1	
Rinsing		.05
	3	.45

Cotton Yarn—Dyed with Direct Colors.

(500 pounds).

	h.	m.
Bringing to boil		.10
Boiling		.15
Running without steam		.15
Washing		.03
		.43

Cotton Yarn—Dyed with Sulphur Colors (heavy shade).

(500 pounds).

	h.	m.
Bringing to boil		.10
Boiling		.15
Running without steam		.20
Pumping dye liquor back to stock tank		.05
Washing		.20
	1	.10

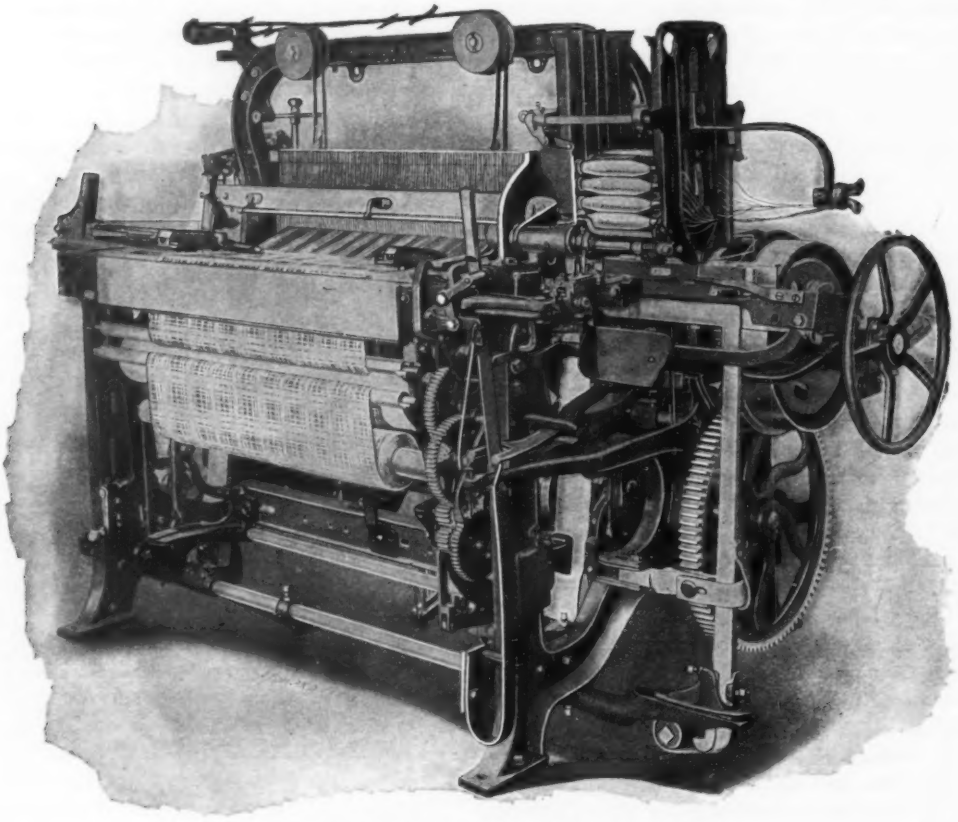
Wool—Dyed with Anizarine Colors.

(500 pounds).

	h.	m.
For chroming	1	.15
Washing after chroming		.10
Bringing to boil		.30
Boiling		.30
Washing		.03
	2	.28

THE CROMPTON & KNOWLES GINGHAM LOOM.

At the textile machinery exhibit recently held in Boston there were no machines that called for greater attention, or received more favorable comment, than the automatic magazine gingham looms in the display space of the Crompton & Knowles Loom Works, of Worcester, Mass. For years there has been a call for a loom upon colors of filling, where this filling could be woven into the fabric at a point previously determined, and where the filling could be automatically replenished before exhaustion. The looms upon exhibition demonstrated that the work along the above lines by the Crompton & Knowles people had accomplished this object. There were two looms running at a speed of 155 picks per minute; one with a two-color filling pattern; one with a four-color filling pattern, and these looms ran continuously, automatically changing from an almost empty bobbin to a filled bobbin, making no mischecks in the pattern, or mispicks from a moving filling thread.



THE NEW CROMPTON & KNOWLES AUTOMATIC GINGHAM LOOM.

The looms are equipped with a magazine with vertical receptacles for holding in reserve the filling, each color in its corresponding holder. On the same side of the loom is a detector for feeling through the shuttle to the bobbin, so that at the near exhaustion of the filling, the feeler motion is put in operation and by indication through the detector against the bobbin, a bobbin with a corresponding color is called from the magazine, and through the attending de-

vices the nearly depleted bobbin is forced from the shuttle and supplanted by a filled bobbin. These operations are consummated without any lost pick, without substituting the wrong color, or stoppage of the loom, except upon breakage of the filling.

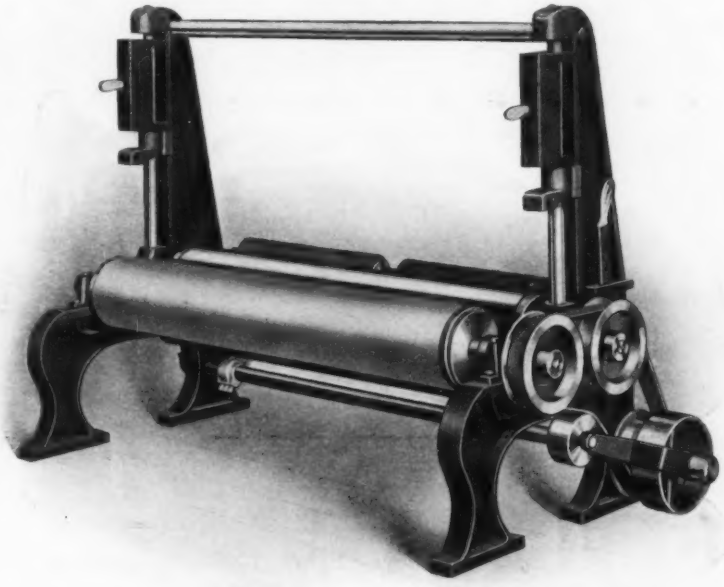
The loom in general is the standard gingham loom, manufactured by this company for so many years and now equipped with the specially devised magazine filling detector and warp stop motion. As devised it certainly admits of a very material saving in the weave room expense, on account of the almost continuous running of the loom, and the greater number of looms that can be operated by one weaver.

We understand that there are a large number of these looms in continuous operation in the leading gingham mills of the country; that repeat orders have been placed; that the yardage output per loom is greater than on the ordinary loom, and the number of looms per weaver is materially increased.

The looms on exhibition had a mechanical detector, used in connection with the regular Draper bobbin and shuttle. We noticed that the amount of filling upon the depleted bobbin was practically nothing, emphasizing the efficiency of the detector motion. The looms upon exhibition were carefully inspected by many mill people and the comments upon their operation were very favorable.

THE BRISTLE CLOTH WINDER.

The bristle system of expanding cloth for dry cans and other machinery where the full width is desired, has now been developed by the American Finishing Machinery Co., 141 Milk St., Boston, in connection with cloth winding. The illustrations show very clearly the simple operation of the machine.



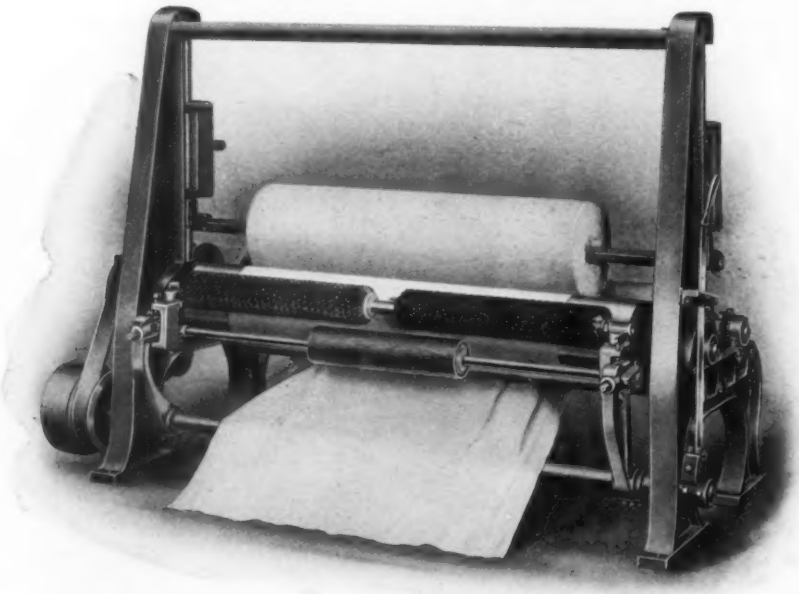
THE BRISTLE CLOTH WINDER. FRONT VIEW SHOWING ARRANGEMENT FOR EASY STARTING WITHOUT STRAIN.

The bristle roll as applied to the winder does not necessarily stretch the cloth unless it is desired, but just enough pressure is applied to smooth out the wrinkles and wind into a firm, smooth roll of uniform width. The proper degree of adjustment is provided for and when the bristle roll is once set with

the desired degree of pressure, it is maintained uniformly at that point. The roll may be lifted from the drum or cloth, but when returned to its working position the pressure remains the same as when first set.

Another useful feature is the arrangement of the pulleys to provide for the easy starting of the machine without causing any strain on the cloth. A lever provided with a ratchet throws the driving pulleys into action slowly and starts the machine at low speed, gradually bringing it up to normal.

The machine is substantially constructed, simple to operate and would seem to be adapted to any kind of cloth. The cloth bristle roll can be arranged to give any degree of pressure or stretch desired, while the speed can be easily adjusted by means of the pulleys. The winder is sold on approval and further information may be obtained from the builders.



THE BRISTLE CLOTH WINDER. REAR VIEW.

Shanghai, China, has eight great cotton mills with several hundred thousand spindles. In these mills over 30,000 Chinese men, women and children are employed.

THE NEW "RADIO" ARC LAMP.

The illustration shows the "Radio" arc lamp manufactured for the Radio Reflector Co., 352 West 13th St., New York. This lamp has been designed to meet the demand for a reliable high efficiency arc lamp that could be depended upon to give a steady light of superior quality. The manufacturers believe that the "Radio" is unexcelled as regards quality, durability and character of the light. The construction has been simplified so as to reduce the insulated parts to a minimum. The globe is held in place by a wire basket system connected with the lamp by a spring device which insures a uniform pressure and consequently prevents breakage of the globes. The globe is easily removed for the purpose of trimming, which can be done in a few minutes.

The lamp is designed for inside and outside use and the design is such that it is an ornament in any room.

For outside use the lamp is black enameled and weather proof, while for inside use the finish is polished brass, or copper oxidized.

The manufacturers state that with this lamp flickering is prevented, the "Radio" shedding a quiet, constant white light, casting no shadows and making it possible to distinguish colors and shades. It is stated that the cost of operating the "Radio" lamp

THE NEW "RADIO" ARC LAMP.

is very low; no expensive changes in wiring are necessary for installing this lamp. Under ordinary conditions 900 square feet of floor space can be well lighted with one lamp, when the lamps are hung 12 feet above the main floor.

Further information can be obtained on application to the Radio Reflector Company.

Since the beginning of 1906 more than 1,200 textile mills have been built in America, of which 136 have been erected in the last six months. Practically half of the 1,200 are in the South.

APPARATUS FOR TESTING MOISTURE IN MATERIALS.

The amount of moisture in materials, particularly yarn, is one that is of great interest to the spinner and manufacturer. Among knitters this question has also received increasing attention. On the Continent the standard natural moisture allowed by the conditioning houses is as follows:

	Per cent.
Raw cotton and cotton yarn	8¼
Carded wool and wool waste	18¼
Wool yarns	17
Linen raw material and yarns	12
Jute raw material and yarns	13¾
Yarn mixtures of wool and cotton	10
Yarn mixtures of wool and silk	16
Spun or schappe raw and carded silk	11

In order to determine the amount of moisture in textile materials an apparatus or

A CONDITIONING OVEN FOR TESTING MOISTURE IN TEXTILES.

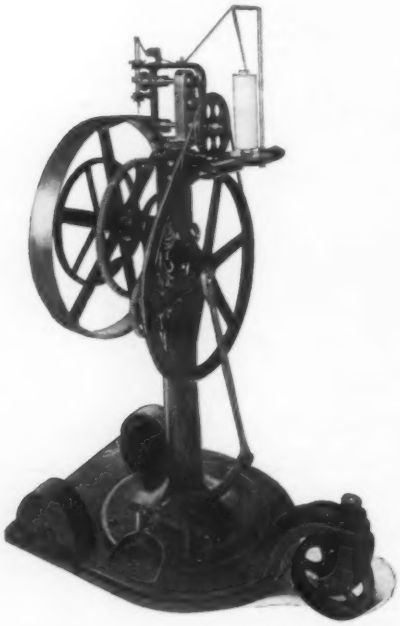
conditioning oven is being put on the market by Alfred Suter, 487 Broadway, New York, which embodies all the essential features of the ovens used in European conditioning houses. This oven, shown in the illustration, can be heated either by alcohol, gas, steam or electricity. It is provided with a hot air chamber, from which a current of heated dry air is passed through the material

to be tested, thus accomplishing in a very short time proper and thorough drying. A finely adjusted scale, with complete set of weights, goes with the outfit, so that loss in weight may be accurately determined. The usual tests of material are one-half pound.

The advantage of this apparatus is its extreme sensitiveness and accuracy, the speed of the test, easy handling and moderate price. The apparatus is so simple and so effective that it should appeal both to spinners and manufacturers, as its use might frequently lead to large savings through determining excess of moisture.

THE DINSMORE IMPROVED FOOT POWER MILL SEWING MACHINE.

The Dinsmore sewing machine has proved its merit in many finishing rooms where it



THE DINSMORE FOOT POWER MILL SEWING MACHINE.

has been in successful use for years. The illustration shows the latest model. It is adapted for either wet or dry cotton or wool goods, sewing ends rapidly and without puckering of the cloth. The stitch can be easily adjusted to suit varying requirements. Special attention has been given to making the machine simple in construction and operation and very durable, so as to stand the more or less rough usage which it meets with in finishing room work. After adjusting the ends on the cylinder the operator starts the machine by means of the treddle and without changing his position.

Further information and references to users of the Dinsmore sewing machine will be given on application by the manufacturers, the Dinsmore Manufacturing Co., Salem, Mass.

THE BEYER PORTABLE CLOCK FOR WATCHMEN.

It has been conceded that the ideal way for keeping track of the movements of a watchman is by the use of a portable clock

FIG. I.

system, but there has been a demand for a number of years for a system allowing the use of practically an unlimited number of stations with one clock. Heretofore, owing to the fact that the female die has been in the clock and the male die on the key, each clock was limited to just a few stations. However, Hardinge Brothers, of Chicago, in their new Beyer Patrol Portable Clock, have overcome this difficulty by using an entirely different principle to any that has ever been incorporated in portable clock systems heretofore. The clock itself contains only the movement, the detective lock and the guide

for the key,—no mechanism whatsoever. Each key contains its own male and female die and recording mechanism, thus each key

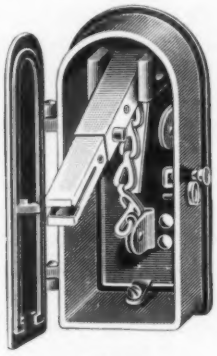


FIG. 2

is a unit in itself, making it possible to use any number of keys with a single clock from 1 to 100.

stead of a stock set of figures as in other systems.

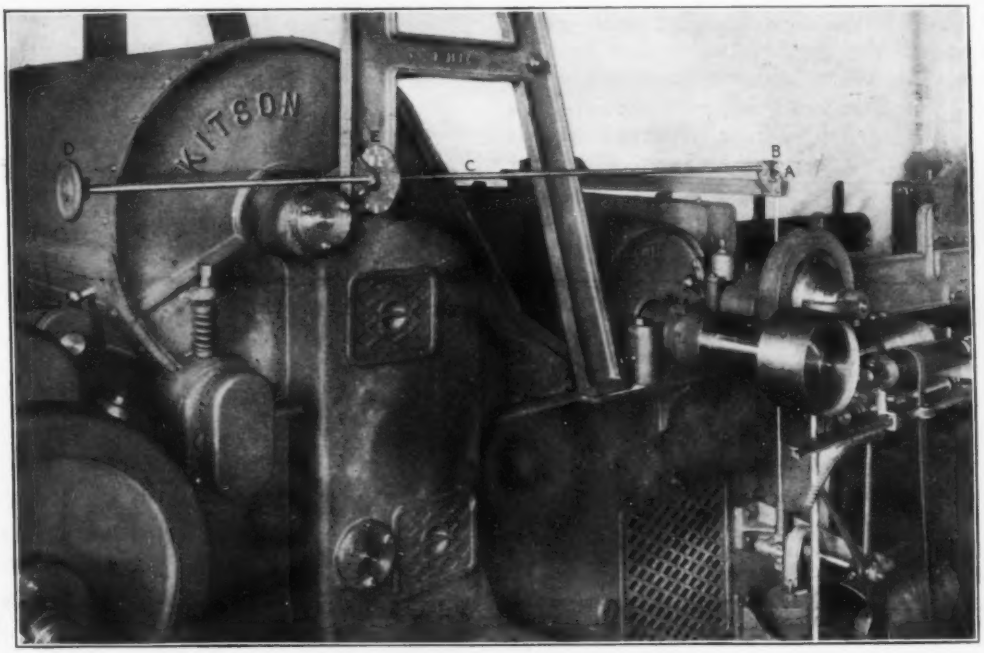
The movement is made interchangeable so that a new one can be substituted for the old one when the latter requires cleaning.

Fig. 1 shows the clock closed and ready for service. Fig. 2 is a patrol clock station showing the key in position.

The manufacturers will be glad to supply further information to any one interested in the clock.

THE BRITTON EVENER REGULATOR.

The Kitson Machine Shop, Lowell, Mass., has recently brought out an improvement for their evener which enables the operative to adjust the feed without passing between the machines. The device which is shown in the illustration is very simple and is of great value. The bevel gear, A, replaces the usual adjusting nut at the end of the evener lever.



THE BRITTON EVENER REGULATOR.

No two sets of keys produce the same record on the paper dial, thus there are no duplicate sets obtainable. This is accomplished by using a combination of letters in-

This meshes with the bevel gear, B, at the end of the rod, C, which extends to the front of the machine and is operated by the hand wheel, D. The rod is supported by the

bracket, E, which also serves as a graduated dial. The pointer fastened to the rod shows the operative how much of a turn has been made.

This device, the invention of a Southern mill man, is now being attached to the Kitson finishers and can also be supplied for old machines which are equipped with Perham and Davis eveners.

A STEAM AND AIR FLOW METER.

Over a hundred years have passed since James Watt perfected a steam engine with practical operating qualities, yet up to the present time in neither the generation, transmission or utilization of steam have the possibilities of operating economy been realized. The engineering profession deserves credit for the many advances made in the construction of boilers, the provision of suitable steam transmission equipment and the perfecting of highly efficient engines and turbines; but in the really vital point—measurement—the engineer has had to be content, like Watt, with the knowledge that enough steam was being generated to do a certain amount of work. Though he has kept an accurate record of coal and water consumed by boilers, he has had no means of knowing how much steam was being delivered to the prime mover—how much utilized, how much wasted.

The necessity for the conservation of our national resources and the sharp competition which makes every economy, however slight, a matter of great importance impressed the engineers of the General Electric Company over four years ago with the fact that a means of doing away with guess work in handling steam would be a wonderful boon to the engineering world. Experiments were undertaken at that time with a view to perfecting a practical steam meter, and as a result of over a thousand actual tests and the expenditure of large sums of money, such an instrument is now on the market. There have been developed a recording steam flow meter, two types of indicating steam flow meters and an indicating air flow meter, each of which will accurately measure the rate of flow of steam, air or other gases, as the case may be, in any size pipe, under any conditions of pressure and temperature met in commercial practice.

The principle governing the action of the flow meter is a modification of that of the Pitot tube. A brass nozzle plug, Fig. 1, screwed into the pipe at the point where the flow is to be measured, carries two sets of openings; a leading set, facing the direction of flow and extending diametrically across the pipe; and a trailing set, consisting of two openings at 90° and one at 180° to the direction of flow. The impingement of the steam against the leading openings sets up in them a pressure equal to the static pressure plus the pressure due to the velocity head, while the trailing set is acted on by the static pressure less that due to the

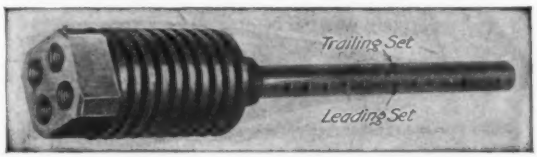


FIG. 1.

velocity. The difference in these values is a measure of the velocity, and for constant temperature and pressure, gives the rate of flow. The pressures existing in the two sets of openings are communicated through separate longitudinal tubes to the outer end of the plug and from there by 1/4 inch iron pipes to the meter.

RECORDING STEAM FLOW METER.

The recording steam flow meter, type R, form D, Fig. 2, is a curve drawing instrument, accurately calibrated to record the total rate of steam flow in pounds per hour in any diameter pipe at any condition of pressure, temperature or moisture.

In this meter there are two cylindrical hollow cups filled to about half their height with mercury and joined together at the bottom by a hollow tube. This "U" tube is supported on and free to move as a balance about a set of knife edges. The two pressures obtained by the nozzle plug are com-

municated to the cups by flexible steel tubing, whereupon the difference in pressure is equalized by a rising of the mercury in the left-hand cup and a falling in the right-hand cup. Due to the displacement of the mercury, the beam carrying the cups tilts on the knife edges until the moment of the counter weights on the extreme right of the meter exactly balances the moment caused by the displacement of the mercury in the left-hand cup.

The motion of the beam is multiplied by levers and is registered by a pen. The time element of the meter consists of an eight day clock driving a drum and feeding paper at the rate of 1 inch per hour. Charts are supplied in sizes to measure a flow of from 2,000 to 240,000 lbs. per hour, and of sufficient length to last one month. The rate of flow can be read at any instant or the average rate of flow calculated for a given time.

RECORDING STEAM FLOW METER.

The recording steam flow meter, Fig. 3, is adapted to any condition of pipe diameter, pressure, superheat or moisture by a hand adjustment of a correction weight on a graduated arm. A chart supplied with the meter shows the correct position for any existing condition. If the pressure in the steam main varies more than 10 lbs. from normal, compensation is necessary for the error thus introduced. An automatic pressure correction device, consisting of a hollow spring, similar to the pressure spring in a steam gauge, is connected so as to be influenced by the static pressure of the steam at the point where the flow is being measured. Any variation of the static pressure causes the spring to expand or contract, and this movement actuates the small correction counter weight and affects the movement of the pen in such a manner that the recorded rate of flow is correct.

The meter weighs 55 lbs. complete and is finished in nickel and dull black. As the glass front of the cover is removable, the working parts of the meter are readily accessible at any time.

INDICATING STEAM FLOW METERS.

The type I, form F, steam flow meter, Fig. 4, will meet general requirements where an indicating rather than a recording instrument is required. Owing to its simplicity of construction, light weight and durability, it will be found especially useful for testing work, locating leaks, etc. The meter will

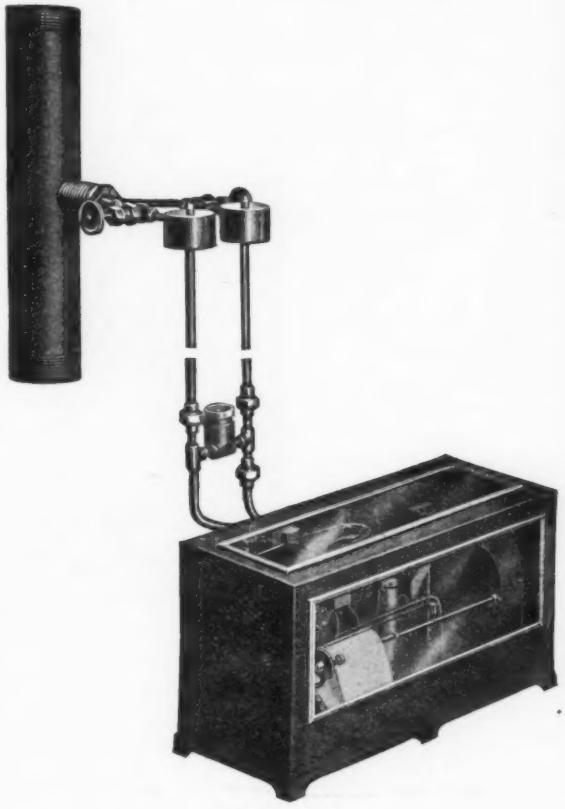


FIG. 2.

indicate the rate of flow of steam in any size pipe, under any conditions of temperature or moisture at the pressure range for which the individual meter is designed. These ranges are: low pressure, 10 to 40 lbs. abs.; medium pressure, 20 to 80 lbs. gauge; high pressure, 75 to 225 lbs. gauge.

The meter consists of an iron casting, cored out to form a "U" tube, and partially filled with mercury. The difference in pressures, as transmitted from the nozzle plug

causes a difference in the mercury levels, and the displacement of the mercury actuates a pulley by means of a small float suspended by a silk cord. The pulley moves a small "U" magnet on the end of the shaft next to the dial in proportion to the change in level of the mercury in the "U" tube. The indicating needle is mounted in a separate cylindrical casing. The pivoted end consists of a bar magnet, free to turn in the same plane as the magnet on the inside of the meter. The mutual attraction of the two magnets keep them parallel; a packed joint to transmit the motion of the pulley to the indicating needle is thus eliminated.

Proper adjustments for the existing conditions of pipe diameter, pressure and temperature are readily made by setting the graduated cylinder which actuates the rack carrying the pointer. When these settings are made, the rack is rotated by hand until the pointer coincides with the indicating needle. The point on the calibrated dial at the intersection of the needle and pointer gives the true instantaneous rate of flow in pounds per hour per square inch pipe area.

This meter is finished in nickel and black japan and weighs only 25 lbs. A leather hand strap is supplied for carrying it.

AIR FLOW METER.

The type I, form F, indicating air flow meter is identical in principle and method of operation with the type I, form F, indicating steam flow meter, except that water is used in the "U" tube as a working fluid and the chart dial is calibrated to read in cubic feet free air per minute at 70° F. per square inch pipe area. The air flow meter is made in two ranges: low pressure 12 to 35 lbs. abs., and high pressure 10 to 120 lbs. gauge.

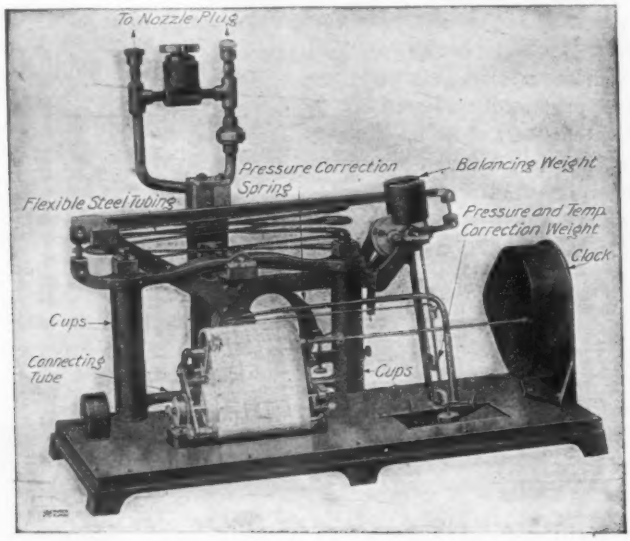


FIG 3.

CALIBRATION.

All meters are carefully calibrated at the factory for operation under steady flow conditions, such as occur in supplying steam to steady flow turbines, to heating systems, for manufacturing purposes, etc. It is not necessary to recalibrate the meter after installation.

The meters will not, however, accurately measure a periodically intermittent flow, such as is required by intermittent flow turbines, reciprocating engines, pumps, etc. In such a case, unless the meter can be placed

so close to the boilers that steady flow conditions exist, recalibration for the existing conditions is necessary after installation.

INSTALLATION.

Station piping arrangements are not interfered with whatsoever in installation, since it is necessary only to drill a 1/2-inch hole in the pipe and insert the nozzle plug. The plug must be placed in a straight run of pipe at least ten pipe diameters from a preceding elbow or tee, and at least two pipe diameters before a following tee or elbow. The same

FIG. 4.

nozzle plug is used for all types of meters, steam or air, the only difference being in the method of piping to the meter. The steam meter can be placed at any desired position below the level of the nozzle plug, provided the 1/4-inch iron pipes to the meter have a slight downward slope throughout. As the piping for an air meter is not filled with water, the air meter can be placed at any desired position whatsoever, above or below the nozzle plug. To operate the same meter on different sizes of pipes, it is thus necessary only to obtain the proper size nozzle plug for the pipe to be metered.

USES.

Some of the many uses for which the meters are adapted can be summarized as follows:

For recording the total amount of steam generated by a battery of boilers.

For equalizing the load on individual boilers of a battery.

For discovering internal leaks in boilers, as shown by the difference in the water input and the steam output.

For determining the deterioration of efficiency of a boiler due to formation of scale, etc.

For determining the efficiency of stoking, etc.

For measuring the amount of steam sold for power, heating or manufacturing purposes.

For discovering losses originating from leaks between boilers and points of consumption, which could not be otherwise detected, as in defective traps, gaskets, valves, etc.

The great value of these meters has already been demonstrated in many instances. In one remarkable case the boilers of a factory consumed one-quarter the amount of coal on Sundays, when the factory was completely shut down, as on week days, when in full operation. Of course, the engineer knew that steam was being lost, but was unable to locate these leaks in the several miles of all sizes of steam pipes. The steam flow meter located the leaks and affected a very considerable saving in steam.

Meters have been tried out in more than fifty power plants and factories and found thoroughly practical, being accurate, easy to install, interchangeable under all conditions, light, economical, cheap and possessing a long life.

The imports of silk into the United States during 1908 amounted to $32,076,000, of which France supplied $13,608,000 worth; Germany, $7,290,000; Japan, $3,888,000, and Switzerland, $3,402,000.

The total exports of cotton goods of domestic manufacture for 1909 amounted to $31,878,566, compared with $25,177,758 in 1908, and $32,305,412 in 1907. Of the total for the year, $12,381,384 represented the value of unbleached cloths, $2,146,117 the value of bleached cloths, and $7,165,579 the value of dyed, colored or printed cloths.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year.

COTTON.

New Mills.

*Georgia, Columbus. As previously reported, the Meritas Mills have been organized with capital stock of $300,000. The company is to build a cotton mill with initial installation of 10,000 spindles and 170 looms, with provision for increasing to 25,000 spindles and about 425 looms. The plant is to be located on their new site of about 20 acres at Thirty-first St., Eighth Ave., Thirty-second St. and the Central of Georgia R. R., on the Highlands just north of the city limits. The spinning mill will be of brick mill construction, two stories high, and the weave shed adjoining, 1 story and basement with saw tooth skylights. Seven cotton warehouses will be erected for the full complement of the mill. The machinery will be electrically driven, the power being furnished by the Columbus Water Power Co. Fred S. Hinds, 19 Milk St., Boston, mill architect and engineer, has just returned from the South, having inspected the site and located the mill. J. T. Broadbent will be agent and the product will be wide goods for the Standard Oil Cloth Co. of New York.

Massachusetts, Fall River. M. C. D. Borden will build a new 108,000-spindle mill to manufacture print cloths for the American Printing Co. Plans have already been made for a 3-story building of brick construction to be located between Central and Pocasset Sts. The building of this mill is contingent upon the city government refusing the petition to build a viaduct through the property on which the proposed mill is to be located.

*Massachusetts, Fall River. The Charlton Mills have organized with the following officers: Earle P. Charlton, president; Chas. B. Luther, vice-president; Arthur S. Phillips, clerk, and James Sinclair, treasurer. These men, with John H. Estes, form the board of directors. The mill will be devoted exclusively to the manufacture of fine goods. The capital stock is $800,000.

Massachusetts, Lawrence. Plans for Wm. Whitman's new mill, which it was intended origirally to build in New Bedford, have not been perfected. A site has been selected in South Lawrence, containing about 15 acres of land. At the office of Mr. Whitman it was said some time will be required to change the plans prepared for the New Bedford site and the extent of the plant cannot be stated at this time. The proposed new mill will make merino yarns and will represent an investment of approximately $1,000,000.

*Massachusetts, New Bedford. Construction work is being pushed forward on the buildings for the Neild Mfg. Co., carrying out the statement of Mr. Neild that the plant will be finished as far as construction is concerned by the first of November. Sixty days will then be allowed to install machinery and get it in running order, and according to schedule, manufacturing will be started Jan. 1, 1911.

*New York, Utica. The Utica Fine Yarn Co. plans to begin manufacturing about July 1. The mill is 105 by 124 feet, 3 stories high, with separate power plant. Twelve thousand ring spindles and steam and electric power equipment is being installed. Fine cotton yarns from 20s to 100s will be the product, and will be sold through Catlin & Co. The Utica Fine Yarn Co. has capital stock of $225,000. Wm. B. Foster is president; W. I. Taber, treasurer; Geo. L. Wood, secretary, agent and buyer, and Geo. E. Wilcox, superintendent.

*North Carolina, High Point. The Pickett Cotton Mills are going ahead with the proposed mill and have engaged Lockwood, Greene & Co., Boston, to prepare plans for a 12,000-spindle and 300-loom plant. The incorporation of this company with capital stock of $250,000 has been reported previously. Robt. L. Steele of Rockingham is president, and F. M. Pickett, High Point, is treasurer. The Southern Power Co. is largely interested and will supply current for the operation of the machinery.

*North Carolina, King's Mountain. The new damask plant to be established by Chas. E. Neisler will be known as the Pauline Mills. Construction work has been started on the mill and it is reported 32 jacquard looms have been ordered.

North Carolina, Lumberton. It is expected that details of buildings for the new Jennings Cotton Mill Co. will be completed at once and construction work started within a few weeks. J. E. Sirrine of Greenville, has been engaged as architect-engineer and is working on plans. As noted, this company was incorporated last December with capital stock of $250,000 and later organized with H. B. Jennings, treasurer of the Dresden Cotton Millls and the Lumberton Cotton Mills of Lumberton, president and treasurer, and F. P. Gray, secretary and assistant treasurer.

North Carolina, Vass. The Vass Cotton Mills Co. have completed their buildings and will install machinery for making 30 to 36s yarn. The capacity is 5,000 spindles. Power will be obtained from the Lake View Power & Light Co., about five miles away.

*North Carolina, Winston-Salem. Contract has been awarded by the P. H. Hanes Ktg. Co. to Fogle Bros. Co. of this city for the construction of buildings for their cotton yarn department, including a main building 1 story high, 135 by 477 ft.; cotton warehouse of three compartments, 50 by 100 ft. each; boiler house; brick reservoir with capacity of 200,000 gallons, etc. A number of cottages are to be built or operatives and these and the mills will be lighted by electricity. As noted some time ago, the machinery equipment will include 10,000 spindles. Machinery contracts have been awarded.

*South Carolina, Greenwood. The Panola Cotton Mills have been incorporated with capital stock of $300,000. F. S. Evans is president and treasurer; G. H. Taylor, vice-president, and W. R. Cothran, secretary.

*Tennessee, Erwin. O. P. Heath & Co. of Charlotte, N. C., are reported to be completing arrangements for their proposed cotton mill near this place. As noted previously, they will operate by electricity, transmitted from their new water power-electric development.

Enlargements and Improvements.

Canada, Ontario, Merritton. The old mill formerly occupied by the Canadian Colored Cotton Mills Co. has been purchased by the Canadian Haircloth Co. of St. Catherines and will be put in operation by them shortly on haircloths.

Georgia, Atlanta. The Fulton Bag & Cotton Mills will build an addition to the bag department, 60 by 100 ft., of brick mill construction. The cost will be about $100,000.

Georgia, West Point. It is reported the Lang Mfg. Co. will double its capital stock and manufacturing capacity. Wm. T. Lang was recently elected president of this company and removed here from Knoxville. Mr. Lang is at the head of the proposed Castle Cotton Mills, Ltd., which he expects to build this year. The buildings will include a 4-story mill of reenforced concrete construction, to be equipped with electric power. Probably the Castle Cotton Mills, Ltd., will be capitalized at $900,000.

*Kentucky, Louisville. The Puritan Cordage Mills are installing the new machinery which it was reported several weeks ago they would add. This new equipment increases the plant's capacity about 30 per cent.

Massachusetts, Fall River. An extension is being built on the north end of the Narragansett Mill's weave shed, and the south end of the weave shed will be connected with the main mill. This addition will be 126 ft. long and is being built by Beattie & Cornell. A rearrangement of machinery will follow the completion of the addition, but probably no immediate increase will be made.

*Massachusetts, Lawrence. The new storehouse to be built for the Arlington Mills is for the cotton department. The building will be 6 stories high, 100 by 200 ft., divided into 4 compartments. A new picker house will not be built as some reports have stated, but certain changes will be made in the present picker house. The total cost of the storehouse and changes in the picker house will be about $150,000.

Massachusetts, Lowell. The Massachusetts Cotton Mills have awarded contract to Patrick Conlon of Lowell, for the erection of their new spinning and weaving mill on East Merrimack St. The building will be 315 by 99 ft., 5 stories high. This mill is to be completed by November 1. Patrick O'Hearn, another Lowell contractor, has been awarded the contract for the erection of the new mill along the Concord River. Mr. O'Hearn has just completed the new power plant for the Massachusetts Cotton Mills and the machinery is now being set in place.

*Massachusetts, West Warren. The new 2-story brick addition for the Warren Cotton Mills of the Thorndike Co. is to replace the old dyehouse building which is now being torn down.

*New Hampshire, Suncook. The new equipment being installed in the Suncook Mills comprises 13,000 spindles, which are being set up in the China and Pembroke mills of this company. They have no other immediate changes in view.

New York, Capron. A charter has been granted the Sauquoit Spinning Co., with capital stock of $600,000. The object given is to manufacture knit goods. Geo. A. Frisbie, Frank A. Bosworth of Utica, and W. G. Waterbury, treasurer of the Old Utica Cotton Co., are the incorporators. The new corporation will take over the Utica Cotton Co., which was bought at bankruptcy sale a short time ago by Mr. Waterbury, and as noted previously, will make extensive changes in the machinery equipment, including the disposing of all the looms and installing new spinning equipment.

*North Carolina, Durham. No. 4 Mill of the Erwin Cotton Mills Co. at West Durham is being equipped with machinery, including 50,000 spindles and 1,000 broad looms for making wide sheetings, also a bleach house of large capacity for bleaching the product. This mill increases the equipment of the Erwin Cotton Mills Co. to 150,448 spindles and 4,223 looms.

*North Carolina, Salisbury. Merely preliminary steps have been taken by the Vance Cotton Mills toward building the additional mill mentioned in earlier reports. The capital stock has been increased from $100,000 to $300,000 and a new 10,000-spindle mill to spin combed yarns will be built, but no details of buildings or machinery equipment have been decided. The report that they would add a weaving department is incorrect.

*North Carolina, Wadesboro. About $90,000 will be required to build the necessary addition for the proposed weaving department of the Wadesboro Cotton Mills Co. Of this amount outside capitalists will subscribe $40,000, while the remaining $50,000 will be furnished by present stockholders.

*North Carolina, Worth. New equipment to be installed by the Harden Mfg. Co. comprises 4,160 producing and 2,000 twister spindles with preparatory machinery. They will try to have the new machinery ready for work by September 10.

*Rhode Island, Woonsocket. The additions to be built by the Lawton Spinning Co. will cost $78,000 and are as follows: Addition to main mill for spinning, 4 stories high, 201 by 107 ft., estimated cost $60,000; addition to finishing department, 3 stories high, 65 by 69 ft., estimated cost $12,000; addition to carding room, 1 story high, 78 by 59 ft., estimated cost $6,000. As noted, the capital stock is to be increased to $1,200,000 and equipment increased to 100,000 spindles.

*South Carolina, Gaffney. Construction work has been started on the addition to the Hamrick Mills, reported in April. As noted, the building will be of brick construction, 2 stories high, and will be equipped with 15,000 spindles and 364 looms, which have been ordered. J. E. Sirrine is the architect-engineer in charge.

*South Carolina, Simpsonville. An increase has been made in the capital stock of the Simpsonville Cotton Mills from $150,000 to $500,000 and the additional mill reported in April will now be built. This addition will include a 2-story building, 134 by 300 ft., to be equipped with 16,000 spindles and 400 looms. Other construction work includes the erection of 60 cottages for operatives.

Mills Starting Up.

Georgia, Dublin. The Dublin Cotton Mills have been reorganized with W. D. McNeal of Fayetteville, N. C., as president. Manufacturing will be started as soon as possible. This plant has been idle for several months.

Mills Shutting Down.

Kentucky, Maysville. The Maysville Cotton Mills, owned by January & Wood Co., are reported to have shut down indefinitely.

Louisiana, New Orleans. The mills of the Textile Mills Corp. here and at Wesson, Miss., are again shut down, the stock in process having been finished. Nothing is known concerning the future of the plant.

Rhode Island, Central Falls. The United States Cotton Co. has closed its plant for an indefinite period. This step was largely due to a strike of the weavers.

WOOLEN.

New Mills.

*Illinois, Chicago. N. A. Bueller is president and B. Boreham is secretary and treasurer of the Chicago Woolen Mills, the $150,000 corporation which is selling stock to build a woolen mill. About $12,000 has been paid in and there are numerous requests for information of the project. The plan is to build a 1-story mill with capacity of 40 looms but to start manufacturing with 10 or 12 looms. The location has not been decided upon, but will probably be in Chicago on the drainage canal. A number of Chicago men with good business standing in other lines are said to be interested. Mr. Bueller was at one time connected with a mill in Knoxville.

*Massachusetts, Lawrence. Work on the new mill for the U. S. Worsted Co. on the site of the old flour mill has been started by Geo. H. Trumbull, the contractor. It is understood the proposed mill will be 6 stories high, of modern brick mill construction. The exact dimensions are not known.

Michigan, Detroit. Wm. A. Fell, 347 Hillger Ave., contemplates starting a plant for the manufacture of knitting yarns. He will locate somewhere in Michigan, and would like information on necessary machinery equipment. Mr. Fell was formerly connected with the Lebanon Woolen Mills of Lebanon, Tenn.

*New York, Salamanca. The Ashworth & Odell Worsted Co. has been incorporated with a capital stock of $125,000 by A. Ashworth, H. L. Odell and H. W. Odell, all of Jamestown, New York. As noted previously, the Ashworth & Odell Worsted Co. is to build a worsted yarn mill in conjunction with Abraham Ashworth Sons, of Jamestown.

Pennsylvania, York. The York Cotton Co. is ready to begin manufacturing and will make dress goods and men's wear. When the company was first organized, it was planned to manufacture Turkish towels, but later it was decided to abandon this plan. The company has capital stock of $25,000. Frank Reeser is president; Herman Z. Shetter, treasurer and buyer; Frank W. Wheeler, superintendent. They have installed 24 looms and will sell the product through C. A. Auffmordt & Co., New York.

Enlargements and Improvements.

Connecticut, Stafford Springs. The Warren Woolen Co. has bought the mill of the Stafford Worsted Co. and will use it for the manufacture of woolen goods. The Stafford Worsted Co. will remove its machinery equipment to the Woonsocket Worsted Mills at Woonsocket, R. I. This mill was formerly the yarn department of the Warren Woolen Co. It was bought by the Stafford Worsted Co. in 1897. In taking over the mill again an increase will be made in the capacity of the Warren Woolen Co., but no definite information can be given on this matter, as their plans have not been fully completed.

*Georgia, Rossville. The addition being built to the Park Woolen Mills is for the purpose of moving their dryer and washer closer to the finishing department. They are also installing a new dryer.

Maine, Sabattus. Owing to increased business the Webster Woolen Co. has decided to build an addition to what is known as the Klondike Mill, and will install several looms.

Massachusetts, Globe Village. The Hamilton Woolen Co. is tearing down old buildings in the mill yard to make room for the new power plant. E. D. Ward, who has charge of the enlargement of the weaving department, will also be in charge of the construction of the power plant. The contract calls for brick construction, 2 stories high, 60 by 70 ft., including a 175-ft. chimney.

Massachusetts, North Adams. Strong, Hewat & Co. are building an addition 60 by 44 ft., 2 stories high and adding another story to the present mill, 50 by 44 ft. The new space is to be used for offices and store room.

Massachusetts, Northboro. The Woodside Woolen Co. is to operate its mill by electric power, furnished by the Marlboro Electric Light Co.

*Massachusetts, Worcester. The new mill, which has been under construction for several months for M. J. Whittall, will be ready for occupancy within a short time. It is a brick structure, 470 by 60 ft., 4 stories high with basement.

Minnesota, Duluth. F. A. Patrick & Co., lessees of the Fosston Woolen Mill of Fosston, Minn., have secured the Imperial Flour Mill in this city and will use it as a woolen mill, removing the machinery from the Fosston Woolen Mill. This company manufactures blankets, flannels, shawls and similar goods on 2 sets and 9 looms.

New York, Jamestown. The new weave shed of the Empire Worsted Mills is completed. The new building is of brick construction, 2 stories high, 120 by 80 ft.

New York, Lestershire. An addition is to be built to the local factory of The Felters Co., formerly the Faatz, Reynolds Felting Co. It is rumored the plant at Millbury, Mass., may be removed to Lestershire, but this could not be verified at the main office, 10 High St., Boston.

*New York, Newburgh. Fred S. Hinds, mill architect and engineer, Boston, has been engaged to make plans for the new worsted yarn mill for Wm. Crabtree & Sons of Montgomery, N. Y. It is planned to build this plant with brick walls in mill construction. A power plant of 250 h. p. is to be built. The plant will be located on South William St., just back of the historical Washington headquarters and monument. One special feature is the extra large windows to make it a well lighted mill. As noted previously, the new mill is to be built at once, as they expect to occupy it before May 1, 1911, when the lease on their present quarters expires.

Pennsylvania, Philadelphia. A four-story brick addition will be built to the factory of A. Holmes & Son at Allegheny Ave. and A St., which will measure 73 ft. 2 in. by 35 ft., and cost $14,000. Holmes & Son are manufacturers of cotton and wool ingrains, carpets and rugs, with 60 looms, the building in which they are located being used partly by them and by other textile manufacturers.

Pennsylvania, Philadelphia. The Canterbury Carpet Co., who have been located on Howard St., below Lehigh Ave., have removed to larger quarters at 2622 N. Bodine St., where they are manufacturing ingrain carpets on 30 looms. James Hindman has succeeded John L. Hooker as secretary and treasurer of the company, which has a capital of $20,000.

Pennsylvania, Philadelphia. A. J. Cameron & Co. will build a new mill on Glenwood Ave. and Pacific St. to cost about $100,000. Stearns & Castor are preparing the plans.

*Rhode Island, Esmond. New looms are being received from the Crompton & Knowles Loom Works by the Esmond Mills.

Rhode Island, Thornton. The Victoria Mills, H. Hartley & Co., Inc., Boston, proprietors, are installing a new wool scouring machine, also a drying machine.

Rhode Island, Wakefield. The Wakefield Mfg. Co. is installing machinery in the old Stone Mill, which has been used for storing wool.

Mills Starting Up.

Arkansas, Nashville. James McMahon, who some time ago purchased the Arkansas Woolen Mill from the receiver, has come here from Philadelphia, for the purpose of putting the plant in operation. Financial assistance has been given by business men. Mr. McMahon's father, Martin McMahon of Knoxville, Tenn., is also interested in the plant. Something over a year ago when the matter of starting the mill was agitated, it was stated that when the plant was started 4 broad looms, a twister and quantities of supplies would be installed.

New Hampshire, Wilton. Manufacturing will be resumed in the Wilton Woolen Mills early in June on a line of cotton warp and woolen filling goods.

*New Jersey, Little Falls. The Nassau Carpet Co. has been organized and will occupy the old plant of the Brunswick Mills. Velvet rugs will be the product. Alexander Murray, who has been connected with the Baltic Mfg. Co., of Little Falls, for a number of years, will be president. Brainerd Avery will be vice-president; W. H. Button, treasurer, and F. H. Button, secretary. N. E. Boomhower will be selling agent.

Oregon, Portland. The Multnomah Mills at Sellwood have begun manufacturing with a force of 40 hands, which it is expected will be increased later to 150 hands.

Mills Shutting Down.

Kentucky, Franklin. The Franklin Woolen Mills are closed and it is reported the property will be sold.

Pennsylvania, Philadelphia. The Thompson Manufacturing Co., manufacturers of upholstery goods and worsted dress goods at Indiana Ave. and A St., operating 40 broad looms, have shut down their plant and report that they will not start it up again. They are now making arrangements to go out of business.

Pennsylvania, Philadelphia. The equipment of the Huddersfield Worsted Co., located at Harold St. and Kensington Ave., in which they have been manufacturing men's wear and dress goods on 24 broad looms, will be offered for sale at public auction on Monday, May 24, the company having decided to go out of existence.

KNIT.

New Mills.

Illinois, Chicago. Kling Bros. & Co. have installed 14 knitting and 6 sewing machines in their building at 1751 North Rubey St., and are manufacturing sweater coats for men, women and boys, using 2/16, 2/20, 3/18, 4/16 worsted. 2/20, 2/23 wool and 2/12, 2/14 and 2/8 cotton yarns. The plant is being operated under the style of the Klingknit Mill.

*Indiana, Richmond. The Richmond Underwear Co. has been incorporated with capital stock of $100,000 by L. M. Flesh, E. A. Todd and H. E. Sims of the Atlas Underwear Co., Piqua, O., and will build a mill here for the manufacture of underwear. This is the result of negotiations between the Commercial Club and Mr. Flesh, who is president of the Atlas Underwear Co., a bonus of $5,000 being the inducement to locate in Richmond. The new building will be erected at the corner of 10th and B Sts. Construction contracts will be awarded within a few days. It is intended to give employment to about 100 people.

*Massachusetts, Fall River. Last November we reported the incorporation of the Marble Quality Mfg. Co., with capital stock of $20,000. The company has organized with the following officers: C. E. Marble, president and treasurer; J. J. McGettigen, vice-president, and H. L. Gettigen, secretary, and will equip a plant at Fall River for the manufacture of hosiery and other high grade knit goods.

*Michigan, Muskegon. The new hosiery manufacturing company, headed by Halfdan Ecktell, will operate under the style of the Sanitary Hosiery Co. and will make a line to be called Silk-Ette hosiery. Details as to the location and equipment have not been worked out. For the present, their address is 440 Washington Ave., Muskegon.

*New York, Dalton. The new Keshequaw Knitting Co. will be ready to begin manufacturing in a few days. Six knitting machines have been installed under the supervision of A. T. Eisaman and will be operated by steam and gasoline on men's fine hosiery. W. D. Burt is president of this company and Mr. Eisaman is treasurer.

*New York, Falconer. The new knitting industry started here by P. A. Barrett and A. E. Williams, the latter formerly proprietor of the old Chautauqua Knitting Mills, operated here some years ago, is known as the Chautauqua Knitting Mills. Four knitting machines and 6 sewing machines are being operated on hosiery and other knit goods. This equipment will be increased shortly to 6 knitting machines.

*New York, Utica. Operations have begun in the plant of the new Walnott Knitting Co. on Blandina St. As noted at the time of the organization of the company, infants' vests will be the sole product.

*New York, Utica. The Supreme Underwear Mills, organized a few months ago, are manufacturing and placing their goods on the market, employing about 25 operatives. There has been a good demand for the company's output and an addition to the operating force is planned. Complete lines of infants' knit good are manufactured of bleached and unbleached combed peeler cotton, merino, Australian worsted, mercerized, silk and silk and worsted mixed. The fabric is made on a new Interlock machine and is claimed to be the finest made in latch needle work. The company occupies the former plant of the Augusta Knitting Co., 82-98 Lafayette St. Arthur E. Snyder is president; Wm. A. Clark, secretary and treasurer, and Albert G. Neel, superintendent.

*North Carolina, Cooleemee. Contract for the construction of buildings for the North Cooleemee Hosiery Co. has been awarded to M. D. Lefter of Salisbury, N. C. Details of company and buildings have been given previously.

*North Carolina, Zirconia. The men behind the project to build a $25,000 hosiery mill here are U. G. Stanton, president of the People's National Bank of Henderson, N. C., and L. J. Jones of Zirconia. They contemplate the manufacture of hosiery and the use of water power to operate the machinery.

Pennsylvania, Boyertown. Daniel Hartman will build a 2-story brick mill, 34 by 60 ft., to be equipped for manufacturing knit underwear.

*Pennsylvania, Easton. Contract for the construction of the mill for the Easton Knitting Mills Co. has been awarded to John H. Goodyear, a local contractor. The company was incorporated in April with capital stock of $10,000. As noted previously, their plant will be on Packer St.

*Pennsylvania, Mount Joy. J. I. Saul of the Auto Knitting Mills, Inc., Harrisburg, will establish a branch plant either here or at West Fairview, on the opposite side of the river from Harrisburg. He expects to arrive at a decision within three weeks.

Pennsylvania, Philadelphia. The knitting plant established at Marshall St. and Hunting Park Ave. by B. A. Roby, and owned by Walter Wesendonck & Co., of New York, will be incorporated under the name of the Mindru Hosiery Mills and will manufacture a line of full fashioned hosiery. The equipment of the plant is now being installed, the order having been placed with E. O. Spindler, 350 Broadway, New York.

Pennsylvania, Philadelphia. Chas. Weber, proprietor of the Bristol Hosiery Mills at Bristol, Pa., which are now out of business, is reported to have started up a new plant in the Dale Mill on Gillingham Ave., Frankford.

Pennsylvania, Shoemakersville. Burkey Bros. are setting up machinery in their building. As noted previously, they propose to manufacture cotton underwear.

*Pennsylvania, South Bethlehem. The new Alacrity Knitting Mill Co., recently incorporated at Harrisburg, with capital stock of $15,000 will manufacture silk and mercerized half hose, begin-

ning operations with 20 knitting machines and 4 sewing machines. John C. Smith, president, manager and buyer, has been with the Halcyon Knitting Mills of South Bethlehem for the past 5 years and understands hosiery manufacturing thoroughly. Wm. Sinwell is treasurer. Manufacturing will be started about June 1 with 18 hands.

Pennsylvania, Tamaqua. Six knitting machines and six sewing machines have been purchased by Warner & Loop, proprietors of the new knit underwear plant. They will begin manufacturing ladies' and misses' fine cotton underwear, using 22s to 26s yarn, about June 15. H. L. Loop is in charge of the plant and attends to the buying. The company plans to increase just as soon as the first installment of machinery is running smoothly.

*South Carolina, Aiken. The Aiken-Carolina Mfg. Co. has been incorporated with capital stock of $10,000 by W. H. Hite and H. E. Gyles of Aiken, and W. E. Hughes of Charleston, S. C. As noted in previous reports, Mr. Hite has leased what is known as the Wise water power site for a period of ten years with the privilege of renewal and is to develop it in connection with the establishment of a 50-knitting machines hosiery mill.

*South Carolina, Greenville. The Muckassee Mfg. Co., recently incorporated with capital stock of $50,000, will manufacture cotton knit underwear. This is in addition to the proposed underwear plant headed by J. D. Gilreath, who expects to organize his company in a week or ten days.

*South Carolina, Greenville. The Gilreath Mfg. Co. has been incorporated with capital stock of $50,000 to manufacture underwear and children's goods by J. D. Gilreath, Lewis W. Parker, J. M. Greer and others. The plant will be located in Williams Hall for the present.

*Tennessee, Knoxville. The new Appalachian Mills have completed the remodeling of their building and will shortly install machinery equipment.

Tennessee, Morristown. The Hamblen Hosiery Mills Co. has been incorporated with capital stock of $100,000 by C. H. Bacon, W. H. Mullens, W. T. Rippetoe, E. M. Grant, W. S. Myers and M. B. Whittaker. This refers to the hosiery mill which it has been previously reported would be established here by C. H. Bacon, treasurer and buyer of the Loudon Hosiery Mills, Loudon, Tenn., and John M. Given, a New York selling agent of knit goods. Plans will be completed at once for a mill.

Enlargements and Improvements.

*Canada, Ontario, Hamilton. Princess Underwear, Ltd., the new company which has taken over the G. B. Perry Knitting Co., has organized with Wm. Gee, president and manager, and George Armstrong of the Hamilton Cotton Co., treasurer. Extensive alterations to the plant will be made in the near future. Two additional stories are contemplated for one of the buildings.

*Illinois, Rochelle. Some increase will be made in the capacity of the Vassar Swiss Underwear Co. as the result of the increase in the capital stock from $200,000 to $250,000. The nature of the enlargement has not been fully decided. This company makes men's ribbed and swiss ribbed union suits in cotton, worsted, silk and merino, operating 65 flat and 11 circular knitting machines and 40 sewing machines. Geo. E. Rutledge is president and buyer, and Harold J. Hellyer is treasurer.

Indiana, South Bend. About $150,000 will be spent this year by the Stephenson Underwear Mills in enlarging the plant on East Colfax Ave. Contract for the construction of a new 4-story brick and concrete building, to be erected east of the present factory, has been awarded to the H. G. Christman Co. and ground will be broken at once. The new building, which alone will cost $80,000, will have a street frontage of 80 ft. and will be 215 ft. in length, and will be especially well lighted, a large area of the outer walls being of glass. It will be protected against fire by an automatic sprinkler system and a 50,000-gallon tank of water as a reserve supply. Spinning, carding and finishing machinery will be installed in the new building. At some future date, the company will tear down the older portion of the plant, replacing it with modern buildings after the design of the new mill to be built this year. G. M. Hewit is superintendent of this company.

*Minnesota, Minneapolis. Construction work has been started on the new concrete mill for the Northwestern Knitting Co., and it is expected the building will be completed in November. It will be equipped with automatic sprinklers and every device necessary for a first class, up-to-date mill. It will be used as an extension of their finishing department and will practically double the capacity of the mill. As noted previously, the dimensions of the mill are 150 by 250 ft., and the cost about $100,000.

New York, Amsterdam. A. V. Morris & Sons, manufacturers of men's woolen and merino underwear, are enlarging No. 4 Mill on Chuctanunda St. The building is being built out 10 ft. and another story added. This building was formerly known as the Barnes Building and was only recently acquired by the company.

*New York, Amsterdam. Work has been started by the Van Brocklin & Stover Co. on the remodeling of the buildings of the Globe Electric Controller Co., purchased by them last November. A new dye house, 50 by 60 ft., will be erected and the buildings put in shape to receive the machinery from the Clermont Mill as soon as possible.

New York, Bath. Additional machinery will be installed in the Bath Knitting Co.'s plant.

New York, Cohoes. The Fuld & Hatch Knitting Co. will build a new storehouse on Oneida St.

*New York, Fonda. The Thissen Silk Fabric Co., recently incorporated with capital stock of $20,000 to succeed the Empire Fabric Co., has organized with Jacob Thissen, president and buyer;

S. Wuerdeman, treasurer. The new company is building a dye house and is reported to have bought the Wortham Silk Mills. Silk gloves, hosiery, underwear, linings, veilings, etc., will be manufactured, giving employment to 150 hands. The plant will be started up in two weeks.

New York, Herkimer. Work will soon be started on the erection of a bleach house for the Gem Dept. of the Union Mills, to be located on land recently acquired by them near the mill on King St. The building will be 90 by 40 ft., 2 stories high. Women's and children's ribbed underwear in cotton and worsted are manufactured in this plant.

New York, New York City. The proposed change in the name of the Bernstein Ribbon Co. to the Gotham Silk Mfg. Co. has been made and the company is sending out a notice that they will continue in enlarged quarters and with increased capacity with the same officers and under the same management as for the last five years. It will be remembered we reported in March they would equip a department for the manufacture of ladies' full fashioned silk hosiery, installing 4 knitting machines and 3 sewing machines. This enlargement is now under way. The company's address is 315-325 East 103d St., New York City.

*New York, Port Leyden. The new bleachery to be built for the Port Leyden Knitting Co. will be constructed of cement blocks and will be 40 by 80 ft., 1 story high.

*New York, Utica. The new factory of the Fort Schuyler Knitting Co. in course of construction on Kimble St. will cost $26,000.

*New York, Utica. The addition to be built for the Mohawk Valley Cap Factory is to be used to enlarge the bleachery. Construction work will be started at once. The enlargement will be finished in about four weeks.

*North Carolina, Cameron. The Regal Hosiery Mills Co. will make the proposed enlargement, which will take the form of an addition to the plant and installation of 15 new knitting machines, giving total equipment of 37 knitting machines and 2 sewing machines. About $3,000 is to be spent on these improvements. Chas. C. Jones is treasurer and buyer.

North Carolina, Durham. Owing to the success of the Durham Textile Mills, the new hosiery industry controlled by negroes, it has been decided to double the capital stock of $2,500 and the equipment of 10 hosiery machines. With the new equipment, the plant will contain 20 knitting machines, 4 ribbers and 4 loopers for manufacturing men's half hose, which is sold in the gray. A. M. Moore is president; C. C. Spalding, treasurer, and Chas. C. Amey, superintendent and buyer.

*North Carolina, Enfield. The Enfield Hosiery Mills Co. has been incorporated with capital stock of $100,000 and succeeds the Enfield Hosiery Mills, owned by Geo. T. Andrews and R. H. Hicks. The capacity of the mill at present is 72 latch needle knitting machines, 30 loopers and 65 ribbers, and it is proposed to double this equipment, the installation to include electric power equipment. Children's ribbed hosiery has been the only line manufactured in the past and the additional output will be seamless hosiery for men and women. R. H. Ricks has been elected president of the new corporation; Geo. B. Curtis, vice-president, and Geo. T. Andrews, secretary, treasurer and general manager.

North Carolina, Statesville. Leroy C. Steele and H. O. Steele have bought the Statesville Knitting Co. and are operating it under the name of the Steele Hosiery Mill. Leroy C. Steele is acting as agent and buyer and R. L. Poplin is superintendent. The plant contains 43 knitting machines and 3 sewing machines operated on ladies' hosiery by electric power. This equipment will shortly be increased by the addition of 25 new knitting machines.

*Pennsylvania, Newport. A local contractor is estimating on a 2-story brick hosiery mill, 160 by 150 ft., for H. A. Romberger. This with other improvements to the mill will increase the capacity about 100 per cent.

Pennsylvania, Philadelphia. Arrangements are now being made for the erection of the large new addition to the Roxford Knitting Co.'s mill at Randolph and Jefferson Sts. The new structure, which will cost about $100,000, will have a frontage of 138 ft. and a depth of 70 ft. and will be 7 stories high, of reinforced concrete construction.

SILK.

New Mills.

*Massachusetts, Holyoke. The new silk mill in which Florence Donoghue was reported interested will begin manufacturing about May 25 under the style of the Donoghue Silk Mfg. Co., giving employment to 25 hands. David Goetz is superintendent and buyer. A line of silks and satins will be the product.

New York, Waverly. The new Hartley Silk Mill will be built on Broad St. and will include a main building, 57 by 192 ft., with wings for engine and boiler house, 40 by 48 ft., a finishing room, 16 by 32 ft., and a silk vault, 14 by 20 ft. The mill will be 1 story high and will be completed late in July.

*Pennsylvania, Allentown. Doherty & Wadsworth Co. have moved some of the looms from their Paterson plant to start their annex in Allentown, owing to the strike of weavers in Paterson. It is not known when the vacant space in Paterson will be refilled.

*Pennsylvania, Edwardsville. Jansen & Pretzfeld, who operate mills at Paterson and Lebanon, Pa., are reported to be the parties interested in locating a large silk mill here. When questioned regarding this report the company stated they could not give information at the present time.

*Pennsylvania, Stroudsburg. A new mill, 52 by 250 ft., 1 story high, will be built here by the Brooklyn Ribbon Mills and is to be equipped with 50 looms to be operated on narrow ribbons. They

plan to ship their machinery from the present location at 790 Broadway, Brooklyn, by October 1. Jacob F. Levy is treasurer.

Enlargements and Improvements.

Massachusetts, Florence. Plans are being prepared by the Nonotuck Silk Co. for an addition to the spun silk mill, which will be 85 by 55 ft., 3 stories high. It is hoped to have the addition ready for use by the first of the year.

New Jersey, Burlington. Specifications for the entire new plant of the Burlington Silk Mills have been drawn up and bids are being received for construction work. The new plant is to be located in West Burlington.

New Jersey, Paterson. Siff & Cohen have purchased the 50-loom annex of I. R. Cohen in the Reinhardt Mill and will move it to the new Reinhardt Mill upon its completion. They also have 50 new looms ordered, which will be delivered in the fall.

*New York, Long Island City. No increase in the equipment is contemplated by the Astoria Silk Works. The new mill will be used as a dyeing department, machinery being removed from an old frame structure.

*Pennsylvania, Easton. During the summer, the Roehlen-Pittenger Silk Co. will build a new mill. Just what new machinery equipment will be needed has not been decided at this time. As noted in April, the Roehlen-Pittenger Silk Co. was incorporated with capital stock of $10,000 to succeed the co-partnership of Leonhard Roehlen and Ralph B. Pittenger, manufacturers of broad silks and ribbons. Floyd H. Reeser is president; Ralph R. Pittenger, secretary and treasurer, and Leonhard Roehlen, general manager.

*Pennsylvania, Seigfried. The additions planned by the Central Silk Mfg. Co., Inc., include the addition of 8,000 spindles for throwing and 164 looms, which will give them 400 looms in all. The new throwing mill is to be built in Northampton, as stated in an earlier report.

Pennsylvania, Upland. Fifty broad silk looms have been ordered by the Chessaqua Silk Co. No further increase will be made at the present time.

Rhode Island, Pawtucket. The Imperial Silk Mill Co. will build an addition to their mill as soon as certain plans they have in mind are matured. J. F. Barry is president and treasurer of this concern and Wm. W. Harrison is vice-president and superintendent.

MISCELLANEOUS.

New Jersey, Wharton. The American Flax Fiber Co., Inc., have bought the "Baker Mill Tract" property and are now erecting a building suitable for their business and installing machinery for producing 10,000 pounds of their prepared flax, American grown principally, per day. This company is incorporated with capital stock of $100,000. E. Kingsland Sargeant, Jr., is president; Joseph Stretch, secretary and treasurer, and P. Kingsland Sargeant is superintendent. The president attends to the buying. They will manufacture pure linen yarns, 8s to 30s, operating by steam and water, with scouring and bleaching departments. They have Factory No. 1 at Bloomfield, N. J., and Factory No. 2 at Wharton, N. J., with main office at Wharton, N. J. The Kingsland-Sargeant process is used in their mills.

*New York, Lockport. The Flaxen Fiber Down Co., recently incorporated with capital stock of $25,000, has organized with J. Sidney Starling, president; Clay W. Parsons, treasurer, and Mr. Starling, manager and buyer. The company will produce all linen products, including yarns, twines and crashes, absorbent linen batting, hospital linen, etc. They plan to begin manufacturing about July 1, but say that details of equipment have not been decided upon. In addition to the above officers, Joseph Robinson is vice-president and Wm. H. Lee, assistant secretary and treasurer. They will bleach and operate by steam and electric power.

Pennsylvania, Chester. The Robt. E. Clarke Thread Co., recently incorporated with capital stock of $50,000, will begin operations about June 15, making spool cotton of all kinds from 200 to 12,000 yards on spools, tubes and cones, operating by electric power. George Shober is president; Robt. E. Clarke, treasurer and buyer, and Chas. H. Cressy, superintendent. All the capital has been subscribed and they are getting the plant ready and looking around for equipment.

Pennsylvania, Philadelphia. A large four-story building will be erected at Ontario and D Sts. for the Ontario Dyeing Co., as an addition to their present plant. The plans provide for a structure with a frontage of 109 ft. and a depth of 161 ft. The cost of the operation is put at $50,000.

Pennsylvania, Philadelphia. Ernest Miller, formerly connected with the Standard Hosiery Dyeing & Finishing Works, has arranged to take over the building formerly occupied by the Paragon Dye Works, which was burned out some time ago. Mr. Miller will equip the plant for the purpose of dyeing and finishing hosiery, making a specialty of silk and cotton mixed hosiery.

Pennsylvania, Philadelphia. The Hooper's Sons Mfg. Co. are arranging for the removal of their Imperial Braiding Mills from 1227 Callowhill St. to new and larger quarters at Juniper and Cherry Sts. In addition to increasing the number of their braiding machines to 1,000, it is the intention to put in an increased number of machines in all their different departments. They are manufacturers of yarns, twines, tapes and cordage which they sell direct.

Pennsylvania, Philadelphia. The Kensington Skein Silk Dye Works, now in the Coulter Bldg., Jasper and York Sts., where they are dyeing skein silks and bleaching worsted knit goods, it is reported have recently purchased the buildings formerly occupied by the late firm of O. J. Meinhardt's Sons at Emerald and Westmoreland Sts., which they are repairing and remodelling for the purpose of removing their plant to that location when it is finished and equipped for dyeing silks.

Pennsylvania, Philadelphia. Parties desiring their name withheld for the present are about to start up a plant at the S. E. corner of Waterloo and York Sts., in which they will manufacture linen huck towels. Six looms have been purchased as initial equipment and others will be installed as the business becomes established. They will sell direct.

Pennsylvania, Philadelphia. The Hulton Dyeing & Finishing Co. have sold to the Ontario Dyeing Co. the building in which they are now located at Ontario and D Sts. The company has also arranged for the erection of a large addition on ground adjoining their plant, recently mentioned by us, and it is said that in addition to dyeing cotton skein and warp yarns they will install skein and warp mercerizing machinery.

Pennsylvania, Philadelphia. The Phoenix Dye Works have been started up by Ernst Muller in the buildings formerly occupied by the Paragon Dye Works, at Clearfield and Witte Sts. They are dyeing, printing and finishing hosiery.

*Rhode Island, Pawtucket. The plant of the Narragansett Narrow Fabric Co. is located on Hughes Ave. in the building formerly occupied by Roscow Bros. Louis W. Bishop, president and treasurer of the new concern, was formerly connected with the Blackstone Webbing Co., as buyer. Machinery is now being put in and manufacturing will be started soon after June 1.

*Rhode Island, Providence. The dye house to be built for the Joslin Mfg. Co. will be a separate building in the yard with the Merino Mills, and will be built as soon as plans are perfected. It is to be equipped for dyeing raw stock and yarn, and will do all the dyeing for the various mills of the Joslin Mfg. Co. on yarns 20s to 50s.

Rhode Island, Shannock. Additional looms have been purchased by the Columbia Narrow Fabric Co., and will be installed as soon as they are received.

Wisconsin, Eau Claire. Plans are being made by the Eau Claire Linen Mills Co. to rebuild its plant recently destroyed by fire. It is said the new building will be much larger than the old one and will be of modern mill construction.

FAILURES AND SUSPENSIONS.

Alabama, Siluria. Upon petition of creditors, Robt. Jenison, Sr., and John E. Morris have been appointed receivers for the Siluria Cotton Mills Co. The plant will be kept in operation.

Pennsylvania, Philadelphia. Walter Thompson, individually and trading as the Thompson Manufacturing Co., manufacturers of worsted dress goods at Indiana Ave. and A St., operating 40 broad looms, has been adjudged an involuntary bankrupt. The liabilities are $38,000 and assets $13,000. The plant is now shut down and will not be started up again.

Rhode Island, Pawtucket. Geo. T. Greenheldge, president, and Robert S. Emmerson, treasurer of the Harrison Yarn & Dyeing Co., have been appointed receivers for the company with authority to continue the business until further orders from the Court. The assets are estimated to be $275,000, while the liabilities are not believed to be more than $115,000. The Harrison Yarn & Dyeing Co. recently added a worsted yarn spinning department and operated this in connection with their yarn dyeing and finishing business.

FIRES.

Canada, Ontario, Georgetown. It is reported the woolen and knitting mill of Alfred Sykes Co. has been destroyed by fire. The total loss is about $30,000, including $12.00 damage on finished goods; fully insured.

Canada, Quebec, Wakefield. The woolen mill of Alexander MacLaren has been destroyed by fire. He made woolen yarns, kerseys and other woolen goods on 2 sets and 8 looms.

Georgia, Dalton. Fire destroyed the plant of the Eagle Hosiery Mills. The loss is estimated at $20,000. This plant was to have been consolidated with the Cherokee Hosiery Mills of Rome, Ga.

New York, West Eaton. The plant of the Beaver Brook Woolen Co., which several months ago took over the Frazer Dale Woolen Co.'s mill, has been destroyed by fire and probably will not be rebuilt. Frank E. Carpenter of Mt. Vernon, N. Y., was one of the officers of the new company.

Pennsylvania, Philadelphia. Richardson Bros. & Gordon, Inc., who removed their plant from 2109 E. Seltzer St., to Bustleton, a suburb of this city, was almost destroyed by fire and it is not known at this time whether they will start up again or not. The plant contained 4 hand knitters, 2 full fashion machines, 1 ribber, 2 loopers and 2 seamers, which they operated on infants' veils, socks and stockings for infants.

FACTS AND GOSSIP.

*Alabama, Eufaula. Nothing definite has been decided by Dixon & Hull regarding the Barbour Cotton Mills, recently purchased by them for $20,000. The company advises they have made no plans for the use of the property.

Alabama, Ragland. W. L. Brown of this place is reported interested in a plan to establish a $250,000 cotton mill.

Arkansas, Little Rock. Reports that a cotton manufacturer has agreed to invest $100,000 in a cotton mill to be located here are hardly correct. The Board of Trade is trying to interest citizens in a plan to build a cotton mill and is simply taking up the matter of supporting such a project with many of the citizens. If the plan is favorably received a meeting will be called to consider the matter.

Arkansas, Little Rock. The Interstate Cotton Seed Crushers' Association, A. D. Allen, president, contemplates the construction of a plant to manufacture press cloth for cotton seed oil mills.

Personals.

August Tilch, second hand in the weave room at the No. 2 Bates Mill, Lewiston, Me., has severed his connection with that company.

Robert Boyce, overseer of spinning at the North Uxbridge Cotton Mills, North Uxbridge, Mass., has resigned to accept a similar position at the No. 4 Mill, Lonsdale Company, Lonsdale, R. I.

Henry G. Young, master mechanic at the Stevens Mill, Fall River, Mass., has severed his connection with that company to accept a similar position with the N. E. Cotton Yarn Company, New Bedford, Mass. He is succeeded by Thomas J. Cox.

Charles Taft has accepted a position as overseer of finishing at the Ellis No. 3 Mill, Monson, Mass. He was formerly employed at the Somerset Woolen Company, same town.

Fred Neff, overseer of finishing at the J. J. Regan Mfg. Company, Rockville, Conn., has severed his connection with that company to accept a similar position with the Lymansville Company, Lymansville, R. I.

Robert Boyce, overseer of spinning at the North Uxbridge Cotton Mills, has accepted a similar position with the Ann & Hope Mills, Monsdale, R I.

Wm. Waldie has accepted a position as overseer of dyeing at the Rutholt Dye Works, 22d and Spring Garden Sts., Philadelphia. He formerly held a similar position at the Paton Mfg. Company, Sherbrooke, P. Q.

E. H. Pierce, overseer of weaving at the Globe Mills, Woonsocket, R. I., has resigned to accept a similar position with the Samoset Company, Valley Falls, R. I.

W. Farwell has been appointed treasurer of the United Woolen Mills Company, with mills at Lowell and Northboro, Mass., to fill the vacancy caused by the death of his father, Walter M. Farwell.

Charles Clarke has accepted the position as designer at the Chapel Mills, Cherry Valley, Mass. He was formerly employed as assistant at the Stanley Mills Company, Uxbridge, Mass.

F. A. Nichols, overseer of weaving at the South Bend Woolen Company, South Bend, Ind., has severed his connection with that company. He is succeeded by John Mulligan who was recently at Beaver Dam, Wis.

Herman Guietzner has accepted the position as overseer of dyeing at the South Bend Woolen Company, South Bend, Ind. He comes from Philadelphia.

David Waugh, overseer of carding at the Massaemet Yarn Mills, Shattuckville, Mass., has severed his connection with that company.

H. W. Kimball has accepted the position as superintendent of the Imperial Cotton Company, Hamilton, Ont., Canada, succeeding David Bell.

Wm. T. Waterhouse has accepted a position as overseer of carding at the Walsh Mill, U. S. Bunting Company, Lowell, Mass. He comes from Dover, Me.

Richard R. Bruce, overseer of carding at the Columbian Mfg. Company, Greenville, N. H., has resigned to accept a position as overseer of carding and spinning at the Massaemet Yarn Mills, Shattuckville, Mass.

Henry Howard has accepted a position as overseer of carding at the Columbian Mfg. Company, Greenville, N. H. He comes from Fall River, Mass.

E. S. Willis, for the past two years overseer of carding and combing at the Lorraine Mfg. Company, Pawtucket, R. I., has severed his connection with that company.

Henry Church has accepted a position as overseer of weaving at the Schuster Woolen Company, East Douglas, Mass., succeeding Walter Pine.

Samuel G. Aull, who for several years has had charge of the weaving department at the Pontiac Mill, Pontiac, R. I., has resigned to accept a similar position at the Linwood Mills, Whitinsville, Mass.

Philip Lemay, who has been in the employ of the Amoskeag Mfg. Company, Manchester, N. H., for the last thirty-five years, part of that time overseer of spinning, has been appointed overseer of the spinning department of the new Coolidge Mill and will have 106,274 spindles under his charge, the largest number in any mill in the world.

Frank Kimball has accepted a position as overseer of carding at the Whitney Woolen Company, South Royalston, Mass. He comes from Providence, R. I.

Clarence C. Ray, overseer of the machine shop of the Cocheco Department of the Pacific Mills, Dover, N. H., has severed his connection with that company. He was presented with a handsome leather traveling bag, watch charm and cigar case by the men employed under him as a slight token of the esteem in which he was held.

Albert Elliott has accepted a position in charge of the pin setting at the Ayer Mills, Lawrence, Mass. For the past sixteen years he had been employed as pin setter under overseer Frank S. Turner at the Lower Pacific Mills.

Samuel Pearson has accepted the position as overseer of weaving at the Pontiac Mills, Pontiac, R. I. He comes from White Rock, R. I., and succeeds Samuel G. Aull, who will take charge of the weaving at the Linwood Mills, Whitinsville, Mass.

George Thomas, for several years overseer of the frame spinning at the Uncasville Mfg. Company, Versailles, Conn., has severed his connection with that company.

Paul Durette, overseer of weaving at the Wyandotte Worsted Company, Waterville, Me., has re-

signed to enter the cloth business with Wm. Levine.

Sterry Converse has accepted the position as overseer of the picking department at the Ellis No. 1 Mill, Monson, Mass.

Harry Buckley has accepted a position as overseer of mercerizing, bleaching and warp and skein dyeing at the Arlington Mills, Lawrence, Mass.

Michael Sullivan has accepted a position as overseer of spinning at the Whitney Mill, So. Royalston, Mass. He comes from Winooski, Vt.

John W Minikin, overseer of dressing at the Willimantic Mills, American Thread Company, Willimantic, Conn., has severed his connection with that company.

William Truesdale, overseer of weaving at the Davenport Woolen Mills Company, Davenport, Ia., has severed his connection with that company to accept a similar position with the Clinton Woolen Mfg. Company, Clinton, Mich.

George W. Miller, machinist at the Warehouse Point Silk Company, Warehouse Point, Conn., has severed his connection with that company.

William Inman has accepted a position in charge of the dyeing at the Milwaukee Worsted Mills, Milwaukee, Wis.

John F. Jordan has been appointed overseer of carding at the Home Mills, Staffordville, Conn. He comes from Western, R. I.

James J. Armstrong has accepted a position as overseer of carding at the Hamilton Cotton Company, Hamilton, Ont., Canada. He was formerly employed at Easthampton, Mass.

Carl Hoessler has accepted the position as overseer of weaving at the Franklin Mills, Franklin, N. H., succeeding N. D. Whitaker.

J. D. Armitage, agent of the Arden Mills, American Woolen Company, Fitchburg, Mass., has severed his connection with that company.

Benjamin Eyers, overseer of finishing at the Cocheco Woolen Mfg. Company, E. Rochester, N. H., has severed his connection with that company to accept a similar position with the Vassalboro Mills, North Vassalboro, Me.

J. C. Chalmers has accepted the position as overseer of the cloth room at the Glenn-Lowry Mfg. Company, Whitmire, S. C., succeeding J. T. Laughlin, who has accepted a position in Gaffney, S. C. Mr. Chalmers comes from Ware Shoals, S. C.

Fred P. Harmon has accepted a position as overseer of finishing at the Cocheco Woolen Mfg. Company, E. Rochester, N. H. He was formerly employed at the Bay State Mills, American Woolen Company, Lowell, Mass.

John McGinnis, superintendent of the Scranton Textile Company, formerly known as the Groat Knitting Company, Scranton, Pa., has severed his connection with that company.

Henry Pero has accepted a position as overseer of carding at the Orcutville Mills, Stafford Springs, Conn. He was formerly employed at the Central Woolen Company, of that town.

James Baldwin, designer at the National & Providence Worsted Mills, American Woolen Company, Providence, R. I., has severed his connection with that company.

Robert Boyce has accepted the position as overseer of spinning at the No. 4 Mill of the Lonsdale Company, Lonsdale, R. I. He comes from No. Uxbridge, Mass.

F. C. Hamilton has accepted the position of superintendent of the Edgemere Mfg. Company, Great Barrington, Mass. He was formerly employed at the Bates Mfg. Company, Lewiston, Me.

Jos. Army has been appointed overseer of weaving at the Millbury Mills, West Millbury, Mass. This mill is operated by the Uxbridge Worsted Company.

John Joyce, overseer of carding at the Black River Woolen Company, Ludlow, Vt., has severed his connection with that company.

E. E. Magner, formerly overseer of dyeing at the Jefferson Mfg. Company, Jefferson, Mass., has accepted a position with the Narragansett Worsted Company, No. Oxford, Mass.

Frank Swanton, overseer of the wool sorting department at the Stirling Mills, Lowell, Mass., has severed his connection with that company.

John Howarth has accepted the position as overseer of carding at the Readville Cotton Mills, Hyde Park, Mass. He was formerly employed at Manchaug, Mass.

John C. McMahon has accepted the position as overseer of burling and sewing at the River Spinning Company, Woonsocket, R. I. He was formerly employed at the Pequea Mills, Philadelphia, Pa.

Michael T. O'Malley has been appointed overseer of carding at the Lorraine Mfg. Company, Pawtucket, R. I. He formerly held a similar position at the Skenandoa Cotton Company, Utica, N. Y.

P. A. Castor has accepted the position as overseer of carding and the picker room at the Linn Mills Company, Landis, N. C.

Jacob D. Babcock has been appointed overseer of weaving at the McGee Mfg. Company, Greenville, S. C. He comes from Woonsocket, R. I.

G. R. Matthews has accepted a position as overseer of the weaving, slashing and cloth room at the Cowikee Mills, Eufaula, Ala. He comes from Rock Hill, S. C.

Charles H. Savage has succeeded D. G. Timmons as manager of the Cotton Duck Company, Laurel, Md. Mr. Timmons is still with this company as agent.

J. E. Wright has been promoted from overseer of weaving to the position of designer and finisher at the Locke Mills, Concord, N. C.

Chas. Henry Haun, formerly of Yonkers, N. Y., has accepted a position as overseer of spinning at the German-American Company, Draper, N. C.

J. L. Grant has accepted the position as overseer of the cloth room at the Fairfield Mills, Winnsboro, S. C. He comes from the Brogon Mills, Anderson, S. C.

J. D. Beseman, for some time superintendent of the Lockmore Mills, Yorkville, S. C., has been appointed assistant superintendent of the Roanoke Mills, Roanoke Rapids, N. C.

E. L. Globe, overseer of carding and spinning at the Patterson Mfg. Company, China Grove, N. C., has resigned to accept a similar position with the Dan River Mills, No. 3, Danville, Va.

C. W. Rice has been appointed superintendent of the Orange Mfg. Company, Orangeburg, S. C. He was formerly employed at the Orangeburg Mfg. Company.

W. W. McIntosh has accepted the position as overseer of carding and spinning at the Peck Mfg. Company, Warrenton, N. C. He comes from Franklinton, N. C.

C. Lee Gilbert has been appointed superintendent of the Globe Mills, Gaffney, S. C., succeeding J. H. Scarboro. Mr. Gilbert was formerly employed at the Gaffney Mfg. Company, of Gaffney, S. C.

W. F. Campbell, who has been overseer of spinning at the Commonwealth Mills, Durham, N. C., which has recently shut down, has accepted a position as assistant overseer of spinning at the Patterson Mfg. Company, Kannapolis, N. C.

J. F. Kersey has accepted the position as overseer of carding and spinning at the Coosa River Spinning Company, Bon Air, Ala. He comes from Westminster, S. C.

George S. Cogswell has been appointed agent of the Arden Mills, Fitchburg, Mass., to succeed J. D. Armitage. Mr. Cogswell was formerly superintendent of the Beoli Mills, same city.

Henry I. Haselton, for thirty years overseer of the worsted carding and combing department at the Amoskeag Mfg. Company, Manchester, N. H., has resigned.

Wm. L. Dobbs, overseer of carding at the Exposition Mills, Atlanta, Ga., was recently killed by a passing train, his mangled body having been found lying in the railroad yards the next morning. He was 38 years of age.

L. N. Burgess, overseer of the cloth room at the Gaffney Mfg. Company, Gaffney, S. C., has resigned to accept a position as overseer of weaving at the new Greer Mfg. Company, Greer, S. C.

Edward Bullard has been appointed overseer of weaving at the Osage Mills, Bessemer City, N. C.

J. E. McGraw has succeeded A. M. Turner as overseer of carding at the Brander Mills, Concord, N. C. He comes from the Cannon Mills.

A. M. Turner, overseer of carding at the Brander Mills, Concord, N. C., has resigned to accept a similar position with the Palmetto Mills, Palmetto, Ga.

Arthur M. Whitley has accepted the position as overseer of drawing at the Nornay Worsted Company, South Barre, Mass. He was formerly employed at Lawrence, Mass.

H. M. Buskey, overseer of spinning at the Shetucket Company, Norwich, Conn., has severed his connection with that company.

Harry R. Rowe has taken charge of bleaching and finishing at the Union Mfg. Company, Peterboro, N. H. He was formerly employed as overseer of the bleaching department at the Elk Mountain Bleachery, Asheville, N. C., and later boss starcher under his father at Kannapolis, N. C.

James E. Roberts has accepted the position as overseer of weaving at the Niantic Mfg. Company, E. Lyme, Conn. He was formerly employed at the Hawthorn Mills, Glenville, Conn.

Armand Henault has been appointed overseer of dyeing at the Angus Park Mfg. Company, East Glastonbury, Conn. He comes from East Weymouth, Mass.

W. B. Osborn, overseer of spinning, spooling and warping at the Weldon Mfg. Company, Weldon, N. C., has resigned to accept a position as overseer of spinning at Kinston, N. C.

Charles Boyd, overseer of spinning at the Mayes Mfg. Company, Mayesworth, N. C., has been appointed superintendent of the new Jewell Mill, Thomasville, N. C.

B. W. Locke, formerly of Greenville, S. C., succeeds James Spears as chief engineer and master mechanic at Pell City, Ala.

J. V. Thomason has accepted a position as overseer of weaving at the Victory Mill, Fayetteville, N. C.

J. L. Turner, assistant superintendent of the Erwin Cotton Mills Company, Cooleemee, N. C., has been appointed superintendent of the Turner Mills Company, Monbo, N. C.

Wm. G. Burt has accepted a position as overseer of carding at the Bibb Mfg. Company, Porterdale, Ga. He comes from Covington, Ga.

James Cunningham has accepted the position in charge of the worsted department at the Wuskanut Mills, Farnumsville, Mass. He comes from Worcester, Mass.

John Ryan, overseer of carding at the Uncasville Mfg. Company, Versailles, Conn., has been appointed overseer of spinning in addition to the carding.

James Cunningham has accepted the position as overseer of spinning and drawing at the Wuskanut Mills, Farnumsville, Mass. He comes from Worcester, Mass.

Wm. Small has accepted the position as overseer of weaving at the Enfield Mfg. Company, En-

field, Mass. He was formerly employed at Fitchburg, Mass.

George A. Elliott has accepted the position as overseer of spinning for J. Broadbent & Son, Unionville, Conn. He was formerly employed at East Rochester, N. H., but more recently at the Burlington Mills, Winooski, Vt.

Richard W. Owen has been appointed overseer of weaving at the Beoli Mill, American Woolen Company, Fitchburg, Mass. He was formerly employed at the Earnscliffe Mills, Providence, R. I.

Edward P. Woodward, overseer of weaving at the Tillotson Silver Lake Mill, Pittsfield, Mass., has severed his connection with that company.

Joseph W. Bailey, principal of the Bradford-Durfee Textile School of Fall River, Mass., has resigned to accept a position of superintendent of the Samoset Company, Valley Falls, R. I.

Thomas Minnehan of Adams, Mass., has been appointed superintendent of the Forestdale Mills, Forestdale, R. I., to succeed A. F. White. Mr. Minnehan was formerly employed at the Renfrew Mfg. Company of Adams, Mass.

John H. Winslow has accepted the position as overseer of weaving at the Thistle Worsted Company, Elmville, Conn. He was formerly employed at the Assawaga Company, Dayville, Conn.

Alfred Anderson has accepted the position as overseer of finishing at the Darling Woolen Mills Company, Holliston, Mass. He was formerly employed at the Davis & Brown Woolen Woolen Company, Killingly, Conn.

Sidney Chapman, second hand in the weaving department of the Wood Worsted Mills, Lawrence, Mass., has been transferred to the Ayer Mill.

Joseph A. Mailloux, who has been connected with the Lowell Weaving Company, Lowell, Mass., has resigned to accept a position with the Jenckes Spinning Company of Pawtucket, R. I.

A. B. Day, superintendent of the Franklin Mills, Franklin, N. H., is to sever his connection with this company on or about June 1. Mr. Day has held this position for over five years.

Benjamin Chase, superintendent of the Samoset Company, Valley Falls, R. I., has severed his connection with that company.

Henry Musser, a retired silk manufacturer of Philadelphia, Pa., died at his home in that city at the age of 62 years.

Clyde J. Demars has accepted the position as overseer of spinning at the Dunham Hosiery Company, Naugatuck, Conn. He comes from Unionville, Conn.

Peter Costello, Sr., overseer of finishing at the Vassalboro Mills, North Vassalboro, Me., has severed his connection with that company.

W. T. Butler, agent of the Union Mfg. Company, Peterboro, N. H., for the past ten years, has severed his connection with that company.

Andrew Perry has accepted the position as overseer of spinning, spooling and warping at the Clinton Mills, Woonsocket, R. I. He was formerly employed at the Whitman Mills, New Bedford, Mass.

Ambrose Ramsley has accepted the position as overseer of spinning at the Wood Mills, Lawrence, Mass. He was formerly employed at the Arlington Mills, same city.

Wm. Dardon, overseer of spinning, spooling and warping at the Uncasville Mfg. Company, Uncasville, Conn., has resigned.

John F. Jordan has accepted the position as overseer of carding at the Home Mills, Staffordville, Conn. He comes from Westerly, R. I.

Wilfred Robertshaw has been promoted at the Arlington Mills, Lawrence, Mass., from second hand over 100 spinnning frames to overseer of all the French drawing and the mule spinning department.

Charles N. Sumner has been appointed assistant superintendent of the Turners Falls Cotton Mill, Turners Falls, Mass., succeeding the late Samuel L. Parker. Last year he resigned his position as bookkeeper with this company to engage in business in Dorchester.

Jos. Miller, overseer of carding at the Amos Abbott Company, Dexter, Me., has severed his connection with that company. He has accepted a similar position at the Kennebec Mills, Fairfield, Me.

Geo. F. Payne, superintendent of the Queen City Cotton Company, Burlington, Vt., has severed his connection with that company.

J. T. Peden, master mechanic at the Brenham Cotton Mills, Brenham, Tex., has resigned to accept a position as chief engineer and master mechanic at the Hillsboro Cotton Mill, Hillsboro, Tex.

G. L. Meacham has accepted a position as overseer of carding at the Knoxville Cotton Mills, Knoxville, Tenn. He comes from Albemarle, N. C.

John Mara has adopted the position as overseer of spinning at the Beaver Dam Woolen Mills, Beaver Dam, Wis. He comes from Hartland, Me.

George Rumbelow has accepted the position as overseer of weaving at the Warren Woolen Company, Stafford Springs, Conn. He was formerly employed in Canada.

P. J. Cook has accepted the position as overseer of carding at the Dana Warp Company, Westbrook, Me. He comes from Lewiston, Me.

P. H. Tobin has accepted the position as overseer of finishing at the Wallace Woolen Mills, Worcester, Mass. He was formerly employed at Dexter, Me.

W. G. Mann, superintendent of the Franklin Felt Company, Franklin, Mass., has severed his connection with that company. He was formerly employed in a similar position at the American Felt Company, City Mills, Franklin, Mass.

DEATHS.

George W. Grove, treasurer of the Argo Mills, Gloucester City, N. J., died at his home in Woodbury. He was also treasurer of the Schuylkill Navy & Athletic Association and a member of the Union League. He is survived by a wife and three sons, and was born in 1863.

Crawford Perry Lincoln, for nine years superintendent at the Enfield Mills, Enfield, R. I., and one of the best known mill men in that section, died at his home in Enfield after a lingering illness at the age of 74 years. Mr. Lincoln started in the mill business when a young man and worked his way up to the position of superintendent. For years he was an overseer of frame and mule spinning, being engaged as such at the Lonsdale Mfg. Company, Lonsdale, R. I., at Berkeley, R. I., and at the Blackstone Mfg. Company. He was at the Blackstone plant about twenty years. Fifty years ago he took charge of the mill at Enfield, in the village now known as Esmond, R. I. The mill was operated by Wm. H. Hope. He remained with this plant about six years when the mill was abandoned. He was born in Providence, R. I., and is survived by a wife and a sister.

Samuel L. Parker, for eighteen years superintendent of the Turner's Falls Cotton Mills, Turner's Falls, Mass., died of heart trouble at the age of 46 years. He was an expert in his line. He formerly lived at Saco, Me., and came to Turner's Falls from the Lonsdale Company. He leaves a widow and two daughters.

George Wilcox, a weaver employed at the Adams Woolen Company, Adams, Mass., was found drowned in the race way of the L. L. Brown Paper Company. He is survived by a wife, one brother and two sisters.

Joseph Brogden, superintendent of the worsted department of the Geo. H. Gilbert Mfg. Company, Gilbertville, Mass., died recently after a short illness. He was born in Bradford, England, and came to this country in 1878. He was engaged at the Lorraine Mills, Pawtucket, as overseer of drawing, and had been at Gilbertville for the past thirteen years. He is survived by a wife, three sons and a daughter.

F. J. Goodspeed, treasurer of the Wilton Woolen Company, Wilton, N. H., died at his home in Wilton. He had been connected with the Wilton Woolen Company for several years and previous to that time he was superintendent of the Madison Woolen Company about 11 years.

John D. Nagle, Philadelphia manager of the Lord & Nagle Company and the Textile World Record, died at his home, 1716 North 24th St., Philadelphia, on Tuesday, May 17. Although in poor health for some time past, he had persisted in attending to business up to the first of May, since which time his health failed rapidly. For twenty-six years he had been connected with the Textile Record and Textile World Record. Prior to the consolidation he was treasurer of the Textile Record Co. and afterwards the manager of the Philadelphia and Southern territory. Probably there was no man in Philadelphia more generally known in textile circles. He had a host of friends among mill men and machinery builders, among whom he had spent so many years, and who respected his integrity and straightforward manner of doing business. He always kept his word, never promised more than he could fulfill and never betrayed the confidences that were reposed in him. The officers of this company and the staff of the Textile World Record lose a valued friend and respected business associate. His widow, a son and a daughter survive him, as well as three brothers, Frank L., the president of the Lord & Nagle Co.; James W., and Marcus Nagle, and two married sisters. Funeral services were held at his Philadelphia home Thursday, the 19th, and on Friday the body was taken to his old home at Pottsville, Pa., for burial.

Wm. A. Barrell, for many years agent of the Lawrence Duck Company's mills, Lawrence, Mass., died at his home on Jackson St., May 13. He was born in East Bridgewater, Mar. 15, 1855, and came to Lawrence early in 1872 as paymaster and superintendent of the Everett Mills. He is survived by his wife, two sons and one daughter.

Frank L. Knowlton, electrical engineer at the power station of the Cocheco Dept. of the Pacific Mills, Dover, N. H., died at the home of his father in North Wood, Wednesday, May 18. He was a man of most excellent qualities and an ardent church worker. He is survived by a wife and one daughter.

Robert Schetty, a silk dyer and for many years manager of the dyeing department of the Pioneer Silk Company, Paterson, N. J., died at his home in that city after an illness of two weeks. He was born in Basle, Switzerland. Forty years ago he came to this country and became associated with the Pioneer Silk Company. The funeral was held Wednesday, May 4. He married Miss Mary Shanley of New York, who died twelve years ago. His surviving children are John Austin Schetty, Mrs. Helen Donlevy and Miss Mary V. Schetty.

Thomas Goodall, a pioneer plush manufacturer of the United States, died at his home in Sanford, Me., of heart failure. He was born at Dewsbury, Yorkshire, England, in September, 1823. He came to this country in 1867 and settled in Sanford, where he established the plant known as the Sanford Mills. This concern employs about 3,000 hands. He retired from active business fifteen years ago, relinquishing the business to his sons, Col. Louis B. G. Goodall, a member of the Governor's staff; Ernest M. and Geo. B. Goodall. Mrs. Goodall died last winter at the family's winter home in Florida.

James Irons, overseer of carding at the Oak Valley Worsted Mills, Tarkiln, R. I., died at his home of cancer. About six weeks ago Mr. Irons was treated at the Rhode Island Hospital, but his illness being uncurable, he returned several weeks ago to await the end.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Ramie; by Herbert A. Carter; The Technical Publishing Co., London, England. Price $2.

Ramie is a fiber in which there is widespread interest because of the beautiful fabrics which are exhibited and to a limited extent manufactured on a commercial scale. There is, however, a great dearth of definite information regarding this fiber and as a result the imagination has been left free to create visions of a vast ramie industry with enormous profits to the pioneers. Under such conditions a reliable hand book dealing with ramie is much to be desired. Mr. Carter has succeeded in placing in concise form a great deal of information on this subject and which is arranged under the following heads: 1, The Ramie Plant; 2, Soil and Climate Essential for Ramie Culture; 3, Ramie Cultivation; 4, The Decortication of Rhea or Ramie Fiber; 5, Method of Preparing Ramie Ribbons for the Market; 6, Degumming Ramie or Rhea; 7, Preparing and Combing Ramie; 8, Drawing, Roving and Spinning Ramie; 9, The Weaving, Dyeing, Printing and Finishing of Ramie; 10, Ramie, Rhea and China Grass in Great Britain; 11, Ramie or Rhea Fiber on the Continent; 12, Ramie in South Africa; 13, The Uses to which Ramie, Rhea and China Grass can be put to in Trade; 14, How to Manufacture Ramie Profitably; 15, Ramie Cultivation in China.

Business Literature.

The Turbo-Humidifier. The G. M. Parks Company, Fitchburg, Mass.

This catalogue is really a book, of over 60 pages, bound in boards, with title stamped in gold. It is an unusually practical book that should prove of more than ordinary value to any mill men interested in a simple, practical device for producing artificial humidity. Besides telling in an interesting way of the invention of the Turbo-Humidifier, and convincingly demonstrating the utility of this particular device, the latter part of the catalogue is a very strong treatise on the entire subject of humidity in general. There is also a chapter describing and illustrating the uses of compressed air, showing the thorough way in which looms and other textile machinery, as well as power equipment, can be cleaned by the use of the Turbo-Humidifier. Aside from its practical utility, this catalogue is of special interest to those interested in book-making, because it is one of the first catalogues using the new "offset process" of printing half-tones on rough stock. It presents in a very satisfactory way subjects like this which require accurate illustrations that give all of the detailed mechanism that is desirable without having the hard, disagreeable glare that usually comes from coated papers on which half-tones are usually printed. The catalogue as a whole is a credit to The G. M. Parks Company, and also to Mr. Hal Marchbanks, manager of Hill's Print Shop, New York, under whose direction it was printed.

New Trade Paper.

"Knit Goods" is the name of a publication published by the McCready Publishing Co. of New York. Mr. C. W. Patman is the editor and Mr. T. I. Wood, formerly connected with the Davison Publishing Co., is the advertising manager. The first number is attractively printed, and as its name implies, it is devoted to the knit goods branch of the trade exclusively.

The Gravity Underfeed Stoker.

The American Ship Windlass Co., Providence, R. I., manufacturers of the Taylor gravity underfeed stoker, report the following recent sales: Lowell Electric Light Corp., Lowell, Mass., one 7-retort stoker for a 600 h. p. B. & W. boiler; Metropolitan Street Railway, New York, two 3-retort stokers for 250 h. p. B. & W. boilers; City of Grand Forks, N. D., one 3-retort stoker for a 250 h. p. Freeman boiler; Dallas Electric Light & Power Co., Dallas, Tex., two 7-retort stokers for 500 h. p. B. & W. boilers; Detroit Public Lighting Commission, Detroit, Mich., two 4-retort stokers for 400 h. p. Stirling boilers; Lake City Power & Light Commission, Lake City, Minn., one 3-retort stoker for 250 h. p. Stirling boiler; and through their New York agents, the Lenher Engineering Co., two 2-retort stokers for heating furnaces at the Solvay Process Co., Detroit, Mich.

An Original Corliss Guarantee.

George H. Corliss had such great faith in his inventions, says the Valve World, that he did not hesitate from the beginning to accept in payment for his engines a proportion of the guaranteed savings in coal consumption, and while some of his guarantees seem to have been reckless, he was always able to do better than he promised.

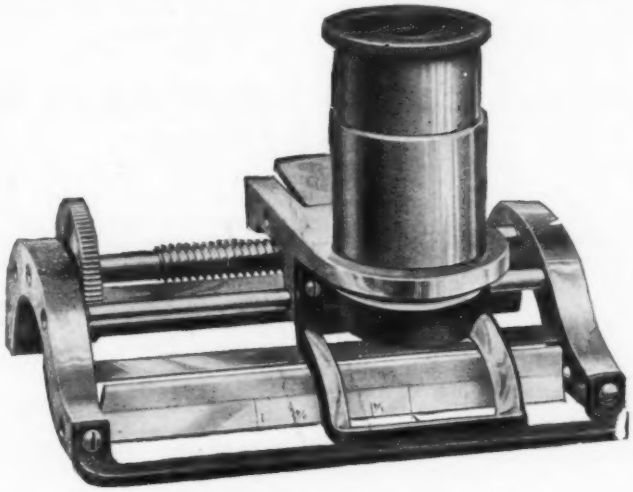
An old associate of Mr. Corliss says: "In 1855 he put an engine and boilers into the James Steam Mill at Newport, Mass., the price for the equipment to be five times the amount of coal saved in one year. The old engines used on an average for the five years preceding the Corliss contract 10,483 pounds of coal a day and were fair samples of the engines in use before Mr. Corliss' time. The new engines were found to use but 5,690 pounds of coal a day, making a saving in a single year of $3,946.84, coal being reckoned at $6 a ton, making the total price paid to Corliss & Nightingale for a 180 h. p. condensing engine and boilers, $19,734.22."

Removed to Larger Quarters.

The Acme Steel Goods Co., Chicago, Ill., announces the removal of its Atlanta Branch from the Empire Building to larger and more spacious quarters at 58-64 W. Alabama St., Atlanta, Ga. This branch is able to effect prompt deliveries to its Southern trade, for it will carry a larger stock of bale bands, buckles and general shipping supplies than formerly.

Lowinson's Triplex Thread Counting Micrometer.

Some time ago we described in our New Machinery and Process Department the thread counting device so widely used abroad and for which Charles Lowinson, 395 Broadway, New York, has taken the American agency. In a comparatively short time it has been adopted by the U. S. Board of Appraisers, as well as by a number of other departments of the government and is also in use by most of the mills in Fall River, Providence, New Bedford and neighboring territory. There are now over 2,000 of these instruments in use and it has been patented in all textile manufacturing countries.



LOWINSON'S TRIPLEX THREAD COUNTING MICROMETER.

Mill men, commission merchants and converters find it a most accurate and convenient device for counting picks and ascertaining the construction of fabrics.

Purifying Feed Water.

Boiler owners are realizing more and more the waste and expense due to impure feed water that scales and corrodes feed water heaters, piping and boilers, in addition to the enormous waste of fuel. Wm. B. Scaife & Sons Co., of Pittsburg, Pa., manufacturers of the Scaife and We-Fu-Go water softening and purifying systems, report an unusually large volume of business. Among some of their recent orders for the Scaife and We-Fu-Go systems are the following:

The Pocasset Worsted Co., Thornton, R. I., 1,000 h. p. We-Fu-Go system; American Sheet & Tin Plate Company, Vandergrift, Pa., 15,000 h. p. We-Fu-Go system; Auburn & Syracuse Elec. Railway Co., Auburn, N. Y., 750 h. p. We-Fu-Go system; River Furnace & Dock Co., Cleveland, O., 6,000 h. p. We-Fu-Go system; Capac Paper Co., Capac, Mich., 600 h. p. We-Fu-Go system; New York & New England Cement & Lime Co., Hudson, N. Y., 8,500 h. p. We-Fu-Go system; Galena Smelting & Mfg. Co., Galena, Kan., 150 h. p. Scaife Automatic system; Spencer Kellogg & Sons, Buffalo, N. Y., 1,500 h. p. We-Fu-Go system; Continental Fiber Co., Newark, Del., 259 h. p. Scaife automatic system.

Increased Business Forces Removal.

The Power Specialty Company, 111 Broadway, New York, report that the volume of sales for the Foster Superheater is increasing so rapidly that the contracts already secured for 1910 equal the total of the business done in 1909. That they might have better accommodations for handling their increased business in the West, their Chicago office has been removed from the Rookery to the People's Gas Building. This office is in charge of Mr. R B. Nutting, with Mr. R. H. Wyld as Assistant Manager.

Will Sell Knit Goods.

The Cotton Manufacturers Sales Co., with headquarters at Statesville, N. C., and branch office at 429 Drexel Building, Philadelphia, has added to its cotton yarn department a hosiery, underwear and knit goods department, which will maintain offices located in the leading business centers. To date offices have been located in Philadelphia, Chicago, Kansas City, Baltimore and Atlanta, and it is the purpose of the company to extend the field of their operations in due time. This department will handle a full line of infants', children's, ladies' and men's hosiery of all grades, and also a complete line of underwear, comprising the product of a number of the large mills in the South and the East. This department is under the management of H. L. McCall, who was formerly secretary and treasurer of the Statesville Knitting Co., Statesville, N. C.

The headquarters of this company have been

removed to larger and more commodious quarters on the second floor of the Morrison Bros.' building, Broad St., Statesville, N. C. This move was made necessary by the rapidly increasing business of this young and growing concern.

"Bellicosa" Softener.

The principal advantages claimed by the Arabol Mfg. Co., 100 William St., New York City, for their latest product, called "Bellicosa" softener, are economy and easy handling. Bleachers who want to use it do not need to dissolve more material than is actually required for each batch of size. It is claimed that two and one-half pounds dissolved in three gallons of hot water will equal twenty-five pounds of ordinary finishing paste.

Southern Representative.

The United States Gutta Percha Paint Co., 12 Dudley St., Providence, R. I., have appointed M. C. Thompson their Southern representative at Charlotte, N. C. Mr. Thompson has been selling paint in the South for twelve years and is favorably known among mill men.

New Boston Offices.

The American Moistening Co. have moved their Boston office from 79 Milk St. to 120 Franklin St., in the new John Hancock Building recently completed.

Commencement Exercises at the Textile Schools.

THE PHILADELPHIA TEXTILE SCHOOL.

The graduating class of the Philadelphia Textile School was this year the largest in the history of that institution. Diplomas, certificates and prizes were awarded to the following:

Day Classes.

Diplomas (Regular Textile Course)—Herbert David Bendheim, Harry Conrad Brodbeck, Jr., Arthur Maurice Brown, Harry George Brown, Edgar Walker Harris, Stanley Hewlett Hart, Lewis Arthur Hird, Esmond Doane Keach, Stewart McConaghy, Vincent Lucas McElroy, Earl Lawton Miller, Herbert G. Mortland, Edwin Oppenheimer, John Gammel Stewart, Samuel Scott Stewart, Diaunyouen Oscar Sze, George Thomas Volkhardt and Carl Otto Walliser.

Diploma (Chemistry, Dyeing and Printing Course)—Solomon Rivelis.

Full Course Certificates.

Wool Course (Two Years)—Willard Wright Hubbard, Jr., John Warren Keffer, William Muir, Liyan Carlton Sze.

Silk Course (Two Years)—Charles Fortunato Coira.

Partial Course Certificates.

Two Years of the Regular Textile Course—Eldon Foote Brewster, Onesimo Gonzalez, Thomas Martin James, Shuji Kawamuro, Frederick Patterson Keller, Cyril Joseph Morrissey, Charles Albert Ramsperger, William Lanmaster Hebert, Ramon Sosa, Meyer Sperber, Bertram Alfred Stroods, Ralph Oehrle Swahm, Algernon Turner Weaver.

Two Years of the Chemistry.

Dyeing and Printing Course—Thomas Forsyth, Louis Peter Masteroff, Gustav Mueller, Sumner Purington Winslow.

Textile School—Evening Classes.

Full Course Certificates (Regular Textile Course, Three Years)—Charles L. Benning, John N. Christie, G. C. Fox, James F. Maguire, William Steinman.

Chemistry Course (Three Years)—William H. Arensmeyer.

Partial Course Certificates.

Jacquard Design (Two Years)—Allen I. Fink, Missals Vartanian.

Woolen Yarn Manufacture (Two Years)—William John Weidner.

Worsted Yarn Manufacture (One Year)—W. T. Bayman, J. Edward Drake, William Fraatz, John J. Hosey, Ernest A. Gilpin, Charles A. Magson, Robert J. McCuen, A. J. Pero.

Prizes.

The National Association of Cotton Manufacturers' Medal: For general excellence, regular course, third year, awarded to Edgar Walker Harris.

The Henry Friedberger Memorial Prize: $10.00 to student ranking second in general excellence, regular course, third year, awarded to Carl Otto Wallison. Honorable mention to John G. Stewart, Harry C. Brodbeck, Jr., and Stanley H. Hart.

The "Textile World Record" Gold Medal: For general excellence and thesis, chemistry, dyeing and printing course, third year, awarded to Solomon Rivelis.

The Associate Committee of Women's Prize: $10.00 for best jacquard design with executed fabric, regular course, third year, awarded to Carl Otto Wallison. Honorable mention to Harry C. Brodbeck, Jr., and Lewis A. Hird.

The Thomas Skelton Harrison Prize: $15.00 for best thesis on practical dyeing results, chemistry, dyeing and printing course, second year, awarded to Thomas Forsyth. Honorable mention to Sumner P. Winslow.

The Miss Clyde Prize: $10.00 for best jacquard design with executed fabric, regular course, second year, awarded to Meyer Sperber. Honorable mention to Charles Ramsperger and Frederick P. Keller.

The John G. Carruth Prize: $10.00 for highest rating in the wool course, second year, awarded to John W. Keffer. Honorable mention to William W. Hubbard, Jr.

The Elizabeth C. Roberts Prize: $10.00 for best specially designed and woven jacquard fabric, second year, awarded to Charles Coira.

The Mrs. Joseph F. Sinnott Prize: $10.00 highest rating in the chemistry, dyeing and printing course, first year, awarded to Arnott R. Broom.

The Delta Kappa Phi Fraternity Prize: $10.00 for best executed work on the hand harness loom, first year classes, awarded to Carl T. Tourtellot. Honorable mention to Harry R. Stephenson and James A. Sinex.

The Phi Psi Fraternity Prize: $10.00 for best executed work in color harmony and design, first year classes, awarded to Hibbert H. Dancy. Honorable mention to Harry R. Stephenson and Carl Nagel.

The Delta Phi Psi Fraternity Prize: $10.00 for general excellence in weave formation and fabric analysis, first year classes, awarded to George A. Handwerk. Honorable mention to Hibbert H. Dancy.

The Mrs. Jones Wister Special Prizes: $10.00 and $5.00, awarded in such manner and for such work as determined by the principal. $10.00 awarded to Frederick P. Keller for satin jacquard damask; $5.00 to Henry Anner, Jr., for work in color harmony.

Prize Scholarships for the School Year, 1910-1911, awarded to Ramon Sosa (second year, regular course); awarded to Thomas Forsyth (second year, chemistry and dyeing course); awarded to Carl T. Tourtellot (first year, regular course); awarded to William Fraatz (evening class); awarded to Robert F. Smith (evening class); awarded to Hibbert H. Dancy, a special prize scholarship (first year, regular class).

At the annual meeting of the school on Thursday, June 2, the following papers were read: Seconds in Woven Goods, by J. W. France; The Preparation of Raw Silk, by Jos. Harry Shinn; Oriental Rug Colorings, by L. DaCosta Ward; Selection and Preparation of Stock for Low Grade Cassimeres, by Max H. Wagner; Carding and Spinning of Wool for Domestic Blankets, by Walter F. Klemer.

At the commencement exercises in the Broad Street Theatre the annual address was delivered by Henry Turner Baily of Boston, his subject being "The Art Students' Chief Business."

On Friday occurred the annual cruise down the Delaware on the steamer Henry A. Haber. This cruise has become known throughout the nation, the 1910 cruise being the seventh consecutive year that the students and graduates of the Philadelphia Textile School and their guests have enjoyed this feature of the commencement exercises. The annual banquet on Friday was given, the speakers being Mayor John E. Reyburn, William D. Hartshorne of Lawrence, Mass., Eugene S. Benjamin of New York, John Wanamaker of Philadelphia, Theodore C. Search of Philadelphia and Principal E. W. France.

THE BRADFORD DURFEE TEXTILE SCHOOL.

The graduating exercises of the Bradford Durfee Textile School were held on May 31, certificates being awarded to 220 students. An address was made by Frederick P. Fish, Chairman of the State Board of Education. The address of welcome was made by Leontine Lincoln, president of the school and the retiring principal, Joseph W. Bailey. The following day pupils received certificates:

Chemistry and Dyeing—Stanley Bickford Abbott, Frank Emil Arnzen, Arthur Bruno Courtemanche, Lawrence Wheeler Kearns, Frank Kershaw.

Engineering—Raymond Bartlett Gardner, Walter Robert Kelly.

The following evening students received certificates:

Picking and Carding—James Arnold Boynton, William Chapman, Everett W. Clarke, William James Daley, Sr., Leonard Firth, Owen Gilligan, Henry T. Haley, Edward J. Kelly, Charles A. Roberts, James B. Sullivan, John H. Taylor.

Ring Spinning—Damase Bernier, Harry Campbell Best, William Fellowes, Victor A. Hebert, Robert Heywood, Dietrich W. Kruger, William S. P. Murphy, Robert Salter, William Walker.

Mule Spinning—James Kenney, Wilfred Livesey.

Mill Calculations—Edwin Carmichael Harrop, Joseph Eccles, Joseph Briand, Henry Hebert, Robert Healey, Sanderson W. Hays.

Plain Loom Fixing—James Ainsworth, John H. Ainsworth, Thomas H. Ainsworth, William Babington, Henry Blackburn, Harry Boucher, Dougal Burnside, James Bury, John Callahan, Fred Chadwick, Joseph W. Chadwick, Christopher Eckersley, Robert J. Fitzgibbons, John Fletcher, Lester Garlick, Gordon Gildard, Joseph Grundy, Theodore Houde, Albert William Jackson, Philip Jeff, Frank Keefe, Jacob Knowles, Wilfred A. Lamothe, Jonathan Lancaster, John Livesey, Ephraim E. Lord, George Marsden, Edward A. Murphy, James A. Murray, John T. Mycock, Philip Redfern, Joseph W. Reeves, Harry Rostron, Aloysius Smith, Joseph Trembly, Edmund Watson, Thomas Treasure Whittaker, William Duckworth Whittaker, Ulric Trahan.

THE LOWELL TEXTILE SCHOOL.

The graduating exercises of the evening classes of the Lowell Textile School were held on May 4. The address of welcome was delivered by President Cumnock, and the address to the school by Frederick P. Fish, Chairman of the State Board of Education. The certificates were presented to the following graduates by Principal Charles H. Eames:

Course I (2 years) Cotton Spinning.

Carl Eugene Bailey, Lowell, Mass.; Heisayu Fujiyoshi, Lowell, Mass.; Arthur Winfield Hird, Lowell, Mass.; Arthur Lemire, Lowell, Mass.; John Henry Shackleton, Lawrence, Mass.; Allen Reed Williams, Lowell, Mass.; John Alfred Worthington, Lowell, Mass.

Course IIb (3 years) Worsted Spinning.

Ellsworth Otis Caldwell Hill, Lawrence, Mass.; Samuel Scott Kershaw, North Chelmsford, Mass.

Course III (3 years) Designing.

Joseph Harris Burgess, Methuen, Mass.; Edward James Cox, Lowell, Mass.; Paul Carl Hering, Lawrence, Mass.; Albert Augustus Hodgkins, Lowell, Mass.; Albert Louis Mabbett, Lowell, Mass.; Francis Xavier Root, Jr., Lowell, Mass.

Course IV (4 years) Chemistry and Dyeing.

Hugh Christison, Methuen, Mass.; Frederic Whitney Jordan, Lowell, Mass.; Henry Stewart Redman, Lowell, Mass.; William Wright Stewart, Lawrence, Mass.; Samuel Scott, Lawrence, Mass.; Frederick Augustus Whitney, Lowell, Mass.

Course IV (2 years) Elementary Chemistry.

George Clifford Dunn, Lowell, Mass.; James Alfred Hird, Lowell, Mass.; Gavin Oates Holt, Lowell, Mass.; Joseph Albert LaJeunesse, Lowell, Mass.; John Nicoll, Andover, Mass.; William Paris Whitman, Lowell, Mass.

Course Va (1 year) Cotton Weaving.

Harry Anderton, Lowell, Mass.; Lester Ambrose Flemings, Lowell, Mass.; George Edward Hibbert, Lowell, Mass.

Course Vb (1 year) Woolen and Worsted Weaving.

Norman Atkinson, Lowell, Mass.; Percy William Berry, Lawrence, Mass.; Robert Rolly Bourchard, Lowell, Mass.; John Alfred Deely, Lowell, Mass.; Fred Ignatius Duckett, Lawrence, Mass.; Louis Voltine Eklund, Dracut, Mass.; Patrick Flynn, Lowell, Mass.; William Gauthier, Lowell, Mass.; William Innes Houston, Lawrence, Mass.; Thomas Vincent Hutton, Lowell, Mass.; Samuel Henry McElroy, Lowell, Mass.; Hiram Gabriel Messiah, Lawrence, Mass.; Gustave Adolph Nelson, Lowell, Mass.; Clarence Willard Nichols, Lawrence, Mass.; Bertram Sewall Stott, Andover, Mass.

Course Vc (1 year) Dobby and Jacquard Weaving.

Jonas Banks, Lowell, Mass.; Ethan John Bourchard, Lowell, Mass.; Fred Fielding, Lowell, Mass.; Martin J. Hoellrich, Lawrence, Mass.; Leopoldo Hurtado, Jr., Lowell, Mass.; Benn Kershaw, Lowell, Mass.; Ernest H. Nelson, Lowell, Mass.; Thomas Robinson, Lowell, Mass.

Course VIa (3 years) Mechanics and Electricity.

Lawrence Francis Dulligan, Lowell, Mass.; William Babcock Hilliard, Lowell, Mass.; Adhemard Charles Jean, Lowell, Mass.; Birger Petterson, Lowell, Mass.

Course VIb (3 years) Mechanical Drawing.

Frank Jackson, Methuen, Mass.; Patrick David McAuliffe, Lowell, Mass.; Joseph Paquin, Lowell, Mass.; Michael Francis Sullivan, Dracut, Mass.; Benjamin Lewis Welch, Lowell, Mass.

Course VIc (3 years) Architectural Drawing.

Edward Gaston Campbell, Lowell, Mass.; Linville Theodore Jorde, Lowell, Mass.; Leo Maurice Maxcy, Lowell, Mass.

Course VId (3 years) Freehand Drawing.

Edith Erma Gaspar, Lowell, Mass.; Alice Louise Gookin, Lowell, Mass.; Blanche Hilda Ledoux, Lowell, Mass.; Mary Isabella Phelps, Lowell, Mass.

Course VIe (2 years) Machine Shop Practice.

Albert Joseph Cutress, Lowell, Mass.; John Flynn, Lowell, Mass.

Course VII (1 year) Woolen and Worsted Finishing.

John Horace Hunton, Lowell, Mass.; George Krause, Lawrence, Mass.; Arthur James Leck, Lowell, Mass.; William Herbert Stopherd, Lowell, Mass.; Henry Todd, Andover, Mass.

Meeting of the American Association of Cotton Manufacturers.

(Continued from front of Magazine.)

On Wednesday John W. Fries of Winston-Salem, N. C., made a report of his visit to the Milan Congress of the International Cotton Federation last year. He said in part:

While the visit had its pleasurable side, yet I believe that if any member of the association who attended such meetings in the future it would be much more satisfactory and helpful if he could go as the accredited delegate of a constituent body of the Federation. England can teach us a great deal we don't know about international commerce. The most vivid impression I brought back from this convention was that the scope of these gentlemen's work is much broader than the growing of cotton in opposition to the planters of the South. It was generally agreed that the production of cotton goods throughout the world was too great for the demand and the only remedy was curtailment. The price of cotton is not a simple arithmetical problem. We cannot say that because a crop of 10,000,000 bales sold for so much 13,000,000 bales should command so much. The demand for cotton the last two years has not been healthy. We have been tumbling over ourselves to buy cotton to run our spindles, whether there was demand for our product or not. We all agree that there has been a comparative supply of 13,000,000 against a demand of 10,000,000, whether you call it bales or not, from the ultimate consumer. We can say we can't have too many mills, that we should spin all our own cotton; we can blame England or Japan for taking away our China market, but the fact remains that our product is in excess of demand. Continental manufacturers see this, but we don't. If nothing else will remedy this condition the law of the survival of the fittest will bring about curtailment. There is no possibility of continued good times until buyere come to us instead of our forcing goods upon them. The consumptive demand is regulated by the cheapness of the product. There is a point in the level of prices when demand must cease. Those who export goods to China can't sell their goods if they peg prices above the ideas of the China buyer. If we undertake to move goods on a 15-cent basis and continue at the same time to make goods in excess of demand we shall not be successful. The time will come when we will have good trade, but buyers will not operate on the present level of prices.

Following Mr. Fries' address the question of joining the International Cotton Federation came up for discussion. A resolution was finally adopted referring the matter to the Board of Governors with power to act. The Convention also adopted the following resolution looking to the improvement in the baling of American cotton:

Whereas, It is a well established fact that the present method of baling American cotton is both wasteful and extravagant, causing unnecessary losses and vexatious annoyances to all the departments of the cotton industry and,

Whereas, The spinners of the world have for several years pleaded for reforms in baling American cotton through the medium of gin house compression of the square bale type and,

Whereas, It now appears that machinery has been invented which will make gin-house compression feasible and practicable in the preparation of the American bale for market upon the most economic basis, not only giving the density required for transportation purposes, but materially decreasing the tare and otherwise conforming to all the modern requirements of the cotton industry and especially the transportation requirement, therefore, be it

Resolved, That the American Cotton Manufacturers' Association in convention assembled hereby requests and urges the railway companies of the South to grant the same rate and concession to square bale gin compressed cotton as is allowed to recompressed cotton at the large compress plants, when such gin compressed cotton complies with said carriers' requirements as to density, covering, etc.

The report of C. B. Bryant, secretary and treasurer, was as follows:

The past year has been burdened with many perplexing problems for the cotton manufacturer, and foreseeing these conditions your board met in this city on October 8 last, and after careful deliberation adopted the following resolutions:

"In view of the disparity now existing between the price of cotton and cotton goods, we resolve:

"1. That a committee of five be appointed to formulate a curtailment agreement.

"2. That we recommend to every mill which is in position to do so to sign this agreement and enter upon general curtailment until the price of goods becomes on a parity with the price of cotton."

Your secretary and the committee were quite active in distributing copies of the resolution to all members, and received replies from many mills indicating their approval of the plan of curtailment, and we believe the large majority of the mills have curtailed to a greater or less extent in accordance with the resolution. It is quite impossible to state in percentage the exact curtailment, but it has gradually increased with the advance in the price of cotton and the decline in the price of and demand for manufactured goods, until now curtailment is being practiced throughout the mills of this country to an extent probably commensurate with the smallness of this cotton crop, which will undoubtedly create a dearth of goods and consequently a great scarcity at high prices later.

The work of the various committees of the organization requires an increasing amount of expense money, and to meet these expenses we recommend your increasing your annual dues to $10 per annum. It is proper that the traveling expenses of your officers and board and the committees in attending various meetings during the year be paid by the association, and then we should not overlook their giving freely of their time without charge for the general benefit of the entire membership.

A careful examination of the financial report attached will show the necessity of such action, or the adoption of some other plan for defraying these expenses.

The membership continues quite representative of the industry. We have received 116 new members during the year. We have lost by death nine, by resignation fifty-four, leaving a net total of 1,115. Our membership should be larger, numbering 1,500 to 2,000, so that the organization may be considered not only representative, but bespeaking the will of the whole textile interest of the country.

A number of builders of textile machinery and appliances had their apparatus installed in different parts of the city. These exhibits, which were well attended, included the following: Stuart W. Cramer, Whitin combers and looms; American Moistening Co.; American Textile Appliances Co.; Joseph Sykes Bros., manufacturers of English card cloth; The Carbolineum Wood Preserving Co.; The Beckmann Co., builders of dyeing machines; The Macrodi Fiber Co.; The C. J. Tagliabue Mfg. Co., manufacturers of hygrometers, thermometers and temperature in pressure controllers; The Hill-Boozer doffing machine; The Hygrosso humidifier; The Coldwell-Gildard Co., electrical stop motions.

The visitors to the convention had an illustration of Southern hospitality, which included a reception to the ladies at the residence of Mr. and Mrs. R. M. Miller, Jr., vaudeville at the Academy of Music, wrestling match, professional baseball, automobile and carriage drives, reception at the residence of Mr. and Mrs. S. W. Cramer, and a barbecue and dance at Lakewood Park.

Not the least important among the features of the convention was the social entertainment and excursions. One which combined business with pleasure was the excursion to the Great Falls Plant of the Southern Power Co., where dinner was served and an inspection made of the electric power plant of this company.

The papers read at the Tuesday and Wednesday sessions were as follows:

Our Mountain Problem and Its Solution.

BY THOMAS R. DAWLEY, Jr.

It is not many years since our mountains were the abiding places of the red man, the bear, wildcats and deer, for a hundred years is not long in the life of a nation. The mountains to which I refer extend from the southern border of Pennsylvania through the Virginias, Kentucky, Tennessee and the Carolinas, into Georgia and Alabama. The Blue Ridge, coming down through Virginia and North Carolina, swings around into South Carolina, forming its northern border, and meeting the Great Smokies, which form the eastern border of Tennessee, merge into the great mass of mountains that descend into Georgia and Alabama.

A TENANT FARMER'S CABIN AND BLACKSMITH SHOP.
This farmer was rated as prosperous. He paid taxes on $150.00 of his savings. The cabin has two rooms, and twenty-two people, all members of the family, lived in it at one time.

In the early days of our history a class of people invaded these mountains whose natural instincts led them to prefer the life of the hunter and trapper to the more settled pursuit of farming. They contested with the Indian his prerogative of chasing the bear to his den, and with him they became embroiled in many a bloody fight. Close on their heels came the refugee from war and rebellion, and from the stockade and prison. As our civilization progressed westward, the farmer, with his characteristic hunger for land, sought the fertile valleys along the rivers, and between the mountain ranges, in which to produce bountiful crops, build a home, and rear a family, like the Saxon of old who invaded England nearly a thousand years before.

The hunter and trapper placed little value on the land. He built his rude cabin of logs on the mountain side, and left the task of raising a scanty crop of corn in his adjacent clearing to his wife and children, while he sought the game that abounded in the surrounding forest. As the game decreased in his locality, or the incoming settlers encroached upon his domain, he moved further on, abandoning his cabin and corn patch to whomsoever might wish to occupy it. He left the fertile valleys to the land-hungry farmer, and his abandoned cabin and corn patch to the refugee, who appears to have been content to eke out an existence by hunting and fishing, and doing an occasional day's work for the farmer in the valley below him. Thus it is we find in these mountains today different classes of people, strikingly different in their characteristics and mode of life.

There is the farmer who produces good crops, lives in a well-built house, and usually rears a family of well-behaved children and sends them away to school or college. On the other hand, there is the tenant farmer, and the poor land owner, who in extreme cases live in miserable cabins or board shacks, having a single room in which they rear their families of children, cook, eat and sleep, without ambition to improve either their own condition or that of their offspring.

Between the well-to-do farmer and the very poor tenant, or poor land owner, there are many intermediate conditions, due to environment, intermarriage, worn-out soil, the washing away of denuded hillsides and isolation. There is the country merchant and trader, the much-hunted moonshiner, and the nomad who owns nothing and does less until actual starvation forces him to work, and then he works only for a few rations to feed his hungry wife and children.

As the object of my investigations in the mountains was to study the class of people who have in recent years been drawn to the Southern cotton mills, the well-to-do farmer, as a class, was soon eliminated from the course of my investigation, for it is not the farmer who owns a farm, and makes even a fair living, who takes his family to a cotton mill. My studies then had to do chiefly with the poor, the poverty-stricken, and in many instances the hungry and forlorn.

Many of us may doubt that there exists a degree of poverty in these mountains to the extent that any of the people are hungry, but when I tell you that I have found family after family huddled together in their miserable cabins all winter long, with no other food than coarsely ground unsifted meal, a little fat pork and black coffee, if we class coffee as a food—you can readily believe that they are hungry.

A Washington Judge said to me on one occasion, when discussing the conditions of these people, "Why, they have corn-bread to eat, and that is the healthiest kind of food."

Well, I should like to feed that Washington Judge on that corn-bread, without butter, or vegetables, or fresh meat, or anything else but a little fat pork and black coffee, for just one week, and then have him tell me what he thinks of corn-bread as a healthy food.

I have seen the poor people of the mountains in the dead of winter, in their little cabins with the storm whistling all around, their hungry, half-clad children hovering over a scanty fire in the fireplace, with scarcely a stick of wood cut to replenish the same. I have seen the snow blown between the unchinked logs of their cabins, and swirled across the room on a sudden blast of wind, the feathery flakes melting upon their bare hands, and feet of the little children extended to the fire.

I have found these children as young as three years chewing tobacco. I have been told that mothers give it to their babies; fathers and mothers both chew it; little girls chew it; and I have found the chief expenditure of many a household was for tobacco. I have had the children tell me that they chewed it because they were hungry; and that they were always hungry. They have told me that they never played because they had nothing to play; they did not know how to play. And they have told me that they got so tired doing nothing they did not know what to do. As for their education, I have found them who had never gone to school, or church or Sunday school. At the age of sixteen, eighteen and twenty, they are stunted in mind and body, and when they are forty they are broken down in health, and in many instances they are physical wrecks.

The only valuable asset that some of these poor people have is a cow. The cow is loved and prized by every member of the family, and truly she ought to be, for without the milk she gives it is doubtful if as many of these mountain children would survive as do. And yet, I have known of this one valuable, life-saving asset of the poor cabin dweller being driven away by the tax collector to satisfy an unpaid tax, while the children cried for its milk.

I doubted that such a state of affairs could exist in this country of ours, but my investigations proved it was true. What these people have to pay taxes on, God and the tax collector only know, but they are all taxed, and rarely do they escape the tax collector. It is a common saying among them that there are two things they cannot escape: taxation and death.

As for the cow, the children might live on her milk, and frequently it is their salvation, but those mountain cows, as a rule, are as poor as their masters. They give very little milk, and there is no way of keeping what they do give. Picture to yourself a single-room cabin in which the entire family cook, eat and sleep, and imagine such a cabin without any other furniture than its rude beds, rickety table and a few broken chairs, a frying-pan, coffee pot and battered water bucket, and then ask, Where does such a family keep their milk? They do not keep it. They simply keep the cow on tap. When they want the milk for breakfast some member of the family milks the cow into a tin cup, panikin or old can, and lets the calf have the rest. Next to the cow, the calf is the most valuable asset of these poor families. I have found families whose only money obtained during the entire year was from the sale of the calf.

You may say that these conditions are exceptional; that I am only describing isolated cases; but in order to show to what extent the conditions were exceptional I confined my work specifically within townships or districts. In these districts a house-to-house visit was made, and the conditions under which each family lived were recorded on a printed schedule. When these schedules were completed they showed, in each case, the kind of house the family lived in, its furnishings, sanitary condition, distance from a town, postoffice, school, doctor, etc. They gave the number of children in the family, their ages, physical condition, literacy, educational facilities, and social and moral surroundings, with the area of land cultivated, crop harvested, and family income during the year, and the kind and quantity of food consumed. In order to obtain these schedules I and my assistants traveled over many miles of mountain territory, hunting the people up in their isolated coves, following them up the creeks and to the tops of mountains fully five thousand feet high. We found them miles from the highway, and frequently had to make our visits to them on foot over a narrow trail leading to their ruinous abodes.

When the work was completed in a township or district, the schedules showed just how typical each case was of the entire group, and for the purpose of forming an idea of the general conditions the families were grouped or classified according to their economic condition. As an illustration, I

have at hand the summary of conditions as found in one of the first townships in which the work was carried on. This summary shows that there were 126 families in the township. Of these 126 families, 16 were rated as well-to-do families, enjoying the comforts of civilized life. Only ten of these farmers, however, owned their farms, the other six renting theirs.

The remaining 116 families in the township were classified as follows: Poor land owners, 46; poor tenants, 28; very poor land owners, 6; very poor tenants, 30. The schedules showed that scarcely

HOUSE OF A TENANT AT THE TOP OF A MOUNTAIN.
This house cost $9.25. Thirteen people lived in it all winter long, with the temperature as low as 10 degrees below zero.

one of those 116 families was able to make a living from the land they owned or occupied, and the conditions under which they lived were deplorable. The cash income of the majority of these rarely exceeded $10 a year. One family was found living near the top of a mountain, consisting of a mother and six children, in such destitute circumstances that my two assistants on the work went back to town, more than 20 miles away, and took up a collection of money and clothing for them. When they returned and gave this woman $7 they had collected, she burst into tears saying it was the first money she had seen in many a long day, and that she had never had so much in her hands at one time before.

This township contained, approximately, a population of 800. It was divided into four school districts, with a total of 376 children of school age. Each district was supposed to have school four months during the year, but my investigations showed that one of the districts had no school at all, and that one of the others had school only part of the time, for the alleged reason that there were not enough scholars in regular attendance to warrant keeping it open.

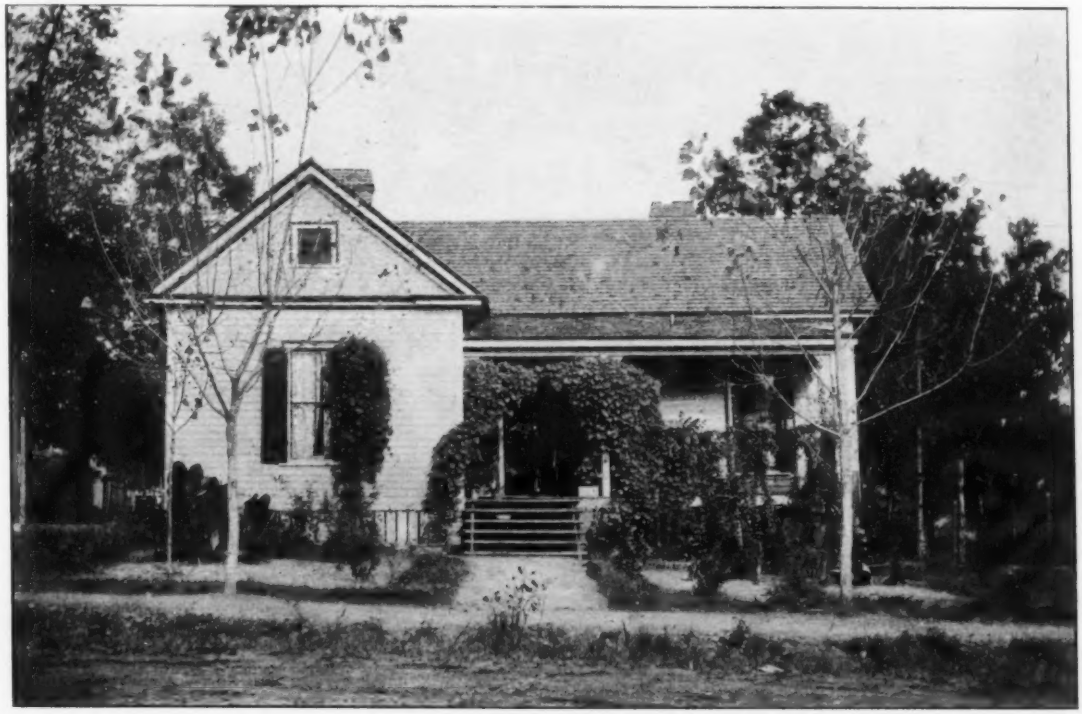
Supposing the children of school age to be equally divided in the four districts, we would have 94 not attending school in one district for the reason that they had no school to attend. In the two districts that had school for four months, the average attendance was estimated to be less than 25, so that in these two districts approximately 75 per cent. of the children of school age did not attend, while in the remaining district there were not enough of them in regular attendance to warrant keeping the school open. The reasons given by the parents for not sending their children to school were such as, "too poor to send," "insufficient clothing," "children don't want to go," "young ones are afraid of the big ones," "school too far," or "too many branches to cross," "school no account no way," and so on.

The conditions in this township were by no means worse than those found in many other districts or townships where the investigation was carried on. There were districts where the economic conditions were fully as bad, if not worse, where the evidence of immorality was greater, and

the physical and educational conditions still worse. In one district there was not a house worthy the name, and every father and nearly every mother were either diseased or broken down in health, and there was one family of seven children all mutes. In a moonshiner's cove we scheduled two families consisting of unmarried mothers and several illegitimate children, not one of whom could articulate complete words, and it was with the greatest difficulty they could make themselves understood.

One district, worked out with the assistance of a native farmer-school teacher, had a density of population so great, and the land was so completely exhausted or washed away, there was not a possibility of the people making a living out of it. One man whom I scheduled, quite a young and intelligent fellow, owning his own land, had harvested only 15 bushels of corn upon it. His total cash earnings for the year were $26.90, and he had to go 18 miles from home to earn that.

This district may be taken as an exemplification of the mountain problem. Less than a hundred years ago a man by the name of Buchanan had settled there. Along the creek were alluvial deposits protected by the trees of a primeval forest, above which rose the rocky cliffs of mountains on either side. A cleared patch in the forest produced for this settler and his family an abundance of corn, and for meat he hunted the bear and deed. As his family increased other cabins sprang up in the neighborhood, and the forest trees were felled to make room for more corn. Since then the forest has compltely disappeared; the alluvial soil has been washed away by mountain freshets, and the original settlers increasing and multiplying have married and intermarried. Two-thirds of the people along the creek have the name of the original Buchanan. A number of them are epileptics, due undoubtedly to this intermarriage, and the problem facing them all is how to get sufficient clothing and food to sustain life.



THE KIND OF A HOUSE A FAMILY MAY GET AFTER LEAVING THE MOUNTAINS AND GOING TO A COTTON MILL.

As I finished my work in this district, my native farmer-assistant exclaimed:

"What is to become of these people!"

And that is the mountain problem. There are in these mountains thousands of people in the conditions I have described. The density of population in some localities is astonishing. There are mountain counties in this state with a density of population, according to the census returns of ten years ago, more than double that of the entire state and more than quadruple that of many of the rich agricultural counties in the lower part of the state. And this population is increasing all the time. In many localities it has doubled in a decade. What is to become of them? is our mountain problem.

The solution of this problem is the cotton mill.

Some of you know that this is true. Many of you may not know it, and you may ask:

"Why the cotton mill?"

To be frank with you, the cotton mill is the one industry that gives employment to children, and work that is suitable for young hands to do. And these people of the mountains must be given work while they are young. If you leave them in their isolated coves and mountain retreats until they are too old,—until they are set in their ways with generations of idle habits and lack of thrift behind them—you can do nothing with them in a cotton mill, or any other kind of a mill. But if you can get them young enough,—yes, I say young enough; because I know, as every other cotton mill man knows in the South, who has had anything to do with these people, you must commence with them while they are young—and if you commence with them young enough you can train them to work, to acquire industrious habits, and become excellent workmen and good citizens. If you wait until they are sixteen, eighteen or twenty years old, it is too late, for they are already becoming atrophied in body and mind to such an extent they don't want to work, and will not work.

If you don't believe this, let me direct your attention to the experience of a large manufacturing industry recently established right in the heart of these mountains—an industry that has no work for women and children, but wants men. This establishment upon starting up not only offered employment to every man in the country for miles around, but offered them more money than they had ever been paid for similar work in their lives, with the result that after struggling with them for a year to get them to work regularly, the contractors gave it up, and they are now bringing into our mountains Russian immigrants to do the work they could not get our mountaineers to do with any degree of regularity.

As a part of my investigations I hunted up those families who had gone from the mountains to the cotton mills. I obtained a record of their conditions in the mountains before going to the mills, and I followed them up to the mills to ascertain what had become of them, and whether they had improved their condition or not. The first of these families was one of the Buchanans, whom I have told you about, living in that densely populated, unproductive mountain district. Eight years previous to my getting his record he was living with his wife and children in a log house, in poverty and ignorance, with scarcely any of the advantages of civilization. Some one told him about the cotton mill, and as his corn crop was insufficient for the coming winter, he sold his few belongings and went to the cotton mill. At the cotton mill he obtained employment for himself and his oldest children, while the younger ones were sent to school. His oldest boy went to night school, and desiring an education, as soon as the family exchequer warranted it, he left the mill and went to the day school, where he pursued his studies until he graduated. The father, on a visit to his old mountain

A LITTLE GIRLS' SEWING CLASS AT THE COTTON MILL.
They all have dolls, and they were taught to make dresses for them. In the mountains many of them never see a doll.

home, told his former neighbors and relatives, as an illustration of the prosperous conditions at the cotton mills, that he had given in $200, a part of his savings, for taxation, and the tax assessor had told him that they took no account of such small amounts as that.

Of 300 families whom I traced to the cotton mills, fully 90 per cent. of them showed similarly improved conditions. Among them were moonshiners who had fled from the revenue officers; farmers whose lands no longer yielded them a subsistence; widowed mothers who could not support their children, and even nomads who had never worked, and never would work in their lives. These latter would not work at the mills, but they would let their children work, and I say that it is much better to let these children work and acquire habits of industry than to legislate them back to the mountains to continue with the indolent habits of their forbears.

At the cotton mills I have seen these children of the mountains going to school. I have seen the little tots in the kindergartens, singing merrily around to the songs of their teachers; I have seen their sewing classes, in their night school, and I have seen the older ones in the mills at the spinning frames. I have seen with what degree of intelligence they progressed at their work, and I have found them where they have not only lifted themselves from poverty and ignorance by the skill of their own fingers, but I have found them where they have become second hands, bosses, superintendents, stockholders, and even mill presidents.

Let us then give due credit to the cotton mill, and if there are evils in the employment of children in our cotton mills, let us search out those evils and stop them, but not bar the progress of our mountain people through the doors of the cotton mill.

Excess Tare.

BY JOHN A. LAW

In endeavoring to ascertain the motives of the program committee in selecting as a theme for discussion so exceedingly dry a subject as "Excess Tare," two possible reasons suggest themselves: One is that they desired, perhaps, a discussion in keeping with the wave of what might be termed "legal liquid limitation," which has recently swept this section. And this thought suggests the second—that probably they desired this paper to act, as it were, in the capacity of a pretzel, or something dry enough to create a thirst for something else that is to follow after the adjournment of the day's meeting. If such is the case, Mr. Sacretary, "here's hoping."

In every line of business there seem to be certain necessary evils which cannot be entirely eradicated, but must simply be minimized as far as practicable—confined within the narrowest possible limits. Such an evil bagging and ties, or "tare," must always seem to the purchaser of cotton, at least so long as cotton is purchased by the gross weight of the bale. And this burden seems particularly onerous when the cost of cotton is around fifteen cents, while the covering, purchased in bulk with the bale at the cotton price, is worth only, say three-fourths of a cent a pound.

Some one is perhaps ready to say that the spinner, or other purchaser, takes all this into consideration in the price which he offers for the cotton; in other words, that the price discounts the tare upon the bale. This is no doubt a sound economic proposition. In fact, students of economics would probably tell us that in the final analysis—under the workings of the laws of supply and demand—it is the consumer, or purchaser, and not the producer or seller that in reality fixes the price of any commodity. But in this day of corners, forced prices, and manipulated markets, it is difficult to reconcile or apply these abstruse propositions. This body of manufacturers would doubtless confirm the assertion that the workings of the laws of supply and demand seem to be overdue along many lines these days. The average manufacturer, when he pays fifteen cents a pound for the bagging and ties on a bale of cotton, and sells them at three-quarters of a cent, is very strong in his opinion that he has lost fourteen and a quarter cents for every pound of covering that is on the bale.

In arguing the advantages of manufacturing cotton in the sections in which it is raised, and thus putting it in its finished, or at least more compact form for distribution, the Hon. Patrick Walsh used to lay stress on the fact that there was only one thing on earth that you could do with cotton. "You can't eat it yourself," he would say; "You can't feed it to your live stock. There is nothing in the wide world to do with it but to manufacture it."

The covering of cotton, hence, is intended for one purpose only—merely to keep it intact and to preserve it during the period of transportation from farm to factory. Unless exposed to moisture, cotton is one of the most enduring, imperishable products of the field. Only so much covering should be allowed as is necessary for its proper protection in transit. It is not supposed that the covering is to take the place of the farm shelter or warehouse, nor of the railroad freight car, thus enabling the shiftless farmer or the negligent transportation company to ruthlessly expose it to the ravages of the weather. In the judgment of the writer it is high time for the purchasers of cotton, whether actual consumers or the middlemen who are held responsible by the consumer for delivery in proper condition, to insist upon greater care in storing.

It is also necessary to make it plain to packers of cotton, whether at gins or compresses, that efforts to make the covering a source of profit, by the use of excess patching or ties, is not only wrong in principle but a simple perpetration of fraud which will not be tolerated.

With a law on the statute books fixing the recognized weight of tare at twenty pounds per bale, the recently-adjourned South Carolina Legislature passed an act making it a misdemeanor to deduct for tare unless its weight exceeds six per cent. of the gross weight of the bale—thus practically fixing a tare allowance of thirty pounds to the bale. It may be of interest to both manufacturers and cotton merchants to know that, in the opinion of

some of the best lawyers of the state, the act is probably unconstitutional in that it limits the right of contract between parties. An early test case will doubtless be made.

Is it not a matter of mutual interest to both purchaser of cotton and the careful, honest packer —whether farmer at the gin or cotton merchant at the compress—that proper deductions be made for unfair loading in each specific instance, rather than that all should be penalized by discount in purchase price? Should not the good shipper join forces with the spinner in removing this unfair source of profit against which he has to compete?

And further, might it not be well for the purchaser or consumer to do still more by offering some inducement in the form of a bonus to the progressive farmer who adopts methods of improved packing with lighter covering?

It seems a foregone conclusion—though slow, perhaps, in arriving—that the process of compressing, with its many attendant disadvantages, such as delays, occasional fraudulent packing, and frequent excessive covering, must sooner or later be abolished. Could not the consumer hasten this result by allowing to the farmer, as a special bonus upon each bale, say one dollar, as representing in part the actual saving on a bale that is packed and covered by improved methods, obviating the necessity of compressing and requiring a covering weighing only twelve pounds, or practically one-half of the usual tare? A recognition of mutual interest and occasion for cooperation would thus be shown in a practical way to the progressive farmer, while, in reality, he is only being put upon a proper parity with the user of methods that are long since out of date and fit subjects for revision.

The average tare on India cotton is eight to nine pounds per bale of average weight of, say 400 pounds, and sales are made under guarantee that they will not exceed ten pounds, a saving in tare loss of nearly one-third being thus effected by their lighter covering and different method of packing.

In this connection the fact should not be overlooked that in all cases of shipment of cotton covered with excess tare an additional loss is sustained in the payment of freight on such excess weights. In cases of long hauls and attendant high freight rates this loss becomes an appreciable one.

Recognizing, hence, that some tare is, of course, unavoidable, but that under prevailing conditions its amount must necessarily be minimized, the question finally resolves itself largely into one of ascertaining what is the least amount of covering that is reasonably required for the proper protection of the "fleecy staple" while in transit. That different amounts are required as between compressed cotton and soft cotton, on account of the difference in the size and density of the bale, is evident, and the proper difference in requirement should be easily determined. Unfortunately, the length of the journey that the cotton is to make, and the consequently increased handling, seems to make it almost necessary to have a further division of compressed cotton into two classes, namely, that intended for export and that for American consumption.

This difference in actual requirement of covering is possibly the occasion of the difference in allowances provided for tare by the Cotton Rules Committee of the Southern Associations as compared with the allowances made by New England mills, Liverpool, and the Continent. In fact, the views of the amount of tare required, and hence, the proper allowance therefor, seems to indicate increased weight in accordance with the distance traveled, Carolina mills fixing it at 24 pounds to the bale, Eastern mills, with few exceptions, at 25 pounds to the bale, and Liverpool and the Continent at, say 26.8 pounds per bale.

Cotton brokers and merchants argue that this difference really works to the detriment of the Eastern as against the Foreign mill, and to the Southern mill as against both Eastern and Foreign, asserting that the cotton merchants add this difference to the price quoted the Southern mills, and if he does not obtain it gives the preference to the Foreign purchaser who gives him an additional allowance of, say three pounds per bale.

The further argument is made that 24 pounds of tare is too little, not allowing sufficient covering for bales that vary from the standard up to 70 inches long. The provision of the Liverpool and Continental rules allowing canvas at 3 9/16 per cent. of the weight of the bale is certainly more elastic, and perhaps more equitable, though possibly more cumbersome in entailing detailed calculation.

Some cotton brokers go so far as to argue that the application of the rules by rigid deductions for excess tare operates against the purchasing mill, in that shippers add to the price of cotton an amount fully covering probable deductions for excess tare, and that the spinner thus pays in each instance for the excess tare, whereas, if the rule were not applied, and hence no such addition to the price made, he would bear the burden of the excess tare only in the comparatively few cases where it actually existed. Few manufacturers are disposed to accept as correct this view of the matter. A similar argument is made as to the franchise or three pounds' allowance for loss in weight. The experience of most purchasers of cotton has, I think, been that both the loss of three pounds and excess tare becomes more and more frequent unless fixed methods are adopted for checking these irregularities.

There is vigorous, and in the opinion of the writer, well-founded objection on the part of cotton merchants as to reservation by the purchaser under the Carolina Mill rules allowing a period of one year within which to make claims for excess tare. Such reservation may perhaps be necessary with fraudulently packed bales, but it hardly seems fair to the shipper to withhold claims for excess covering throughout an entire season, thus affording the shipper no opportunity of verifying claims which he perhaps may have in turn to collect from a previous seller. Few mills are justified in keeping constantly in their opening room a man capable of carefully stripping and weighing tare from each bale as it is opened, and keeping proper record of its mark and number, so that the record

of the individual bales from the various shippers may be eventually grouped and accurate calculation made of the excess covering. In fact, it is questionable whether, in the language of Bret Harte, "the ends would justify the proceedings." Is it not more practicable, and more equitable, to notify the shipper in all cases where, while first unloading the cotton, the covering should appear to the mill as excessive. The shipper could then have his representative go at once to the mill, witness the stripping of such number of bales as were necessary to obtain a fair average of the weight of the tare, and a final adjustment of the matter be then and there agreed upon.

Another feature in which many of the mills are seriously at fault is the custom of selling and re-selling their dilapidated and over-patched bagging patterns to neighboring local ginners, to be re-bought at the cotton price by themselves or other mills. Would it not be advisable for the various groups of mills to have concentration points to which their old bagging and ties could be shipped in bulk for re-working—perhaps for re-weaving the bagging—thus not only eliminating the frequently unwise competition between themselves in sales of their bagging and ties, but also overcoming the greater evil above mentioned, in providing the ginners with covering of such dilapidated condition as simply necessitates excess loading?

And in concluding, Mr. Secretary, I return to the original thought. Should the above dry discussion create a thirst that occasions any "excess tares," I respectfully refer the subject to that most efficient—but I trust, on such occasions as this,—considerate body, the Charlotte police.

Coal and Its Economical Use in Cotton Mills.

BY J. S. BURROWS.

One of the most important supplies which annually, or oftener, demands the attention of the great majority of our mill managers is the coal used for the production of power. This supply generally represents a considerable amount of money, and next to labor is probably the greatest single item of expense. Some knowledge of the tchnique of coal would therefore seem to be of importance to the mill manager, both as concerns the material itself, as well as its proper and economical use.

Such knowledge should embrace (1) an understanding of the relative values of the coals available in any locality; (2) a knowledge of the factors which make up the delivered cost of the coal, and their influence on its value; (3) an appreciation of the responsibility of the various competing suppliers and their ability to meet requirements during strikes or under other adverse conditions; (4) a clear perception of the sources of waste in the boiler plant, and the proper steps to be taken for their correction; and as experience is gained (5), the development of a simple, systematic routine for boiler-house and fuel accounting which will not prove a burden to the manufacturing end of the business.

While these questions are naturally very absorbing ones to the coal man, who at present is laboring under a plethora of scientific theory regarding the use of coal, I realize that it is only the practical side which is of interest to the members of this Association, and shall endeavor to eliminate as much theoretical discussion as possible.

Instead of starting at the beginning and taking these questions up in regular order as enumerated above, it would seem advisable to begin in familiar surroundings and with this end in view I invite each of you to mentally step down into your boiler-room and observe closely what is taking place there.

We will assume that a good trade of semi-bituminous coal is being used, and that the plant has been running for several hours so that the fires are in normal condition and the usual load is on the boilers. When the time for the next firing arrives, a charge of coal is thrown on the grate in varying amounts, according to the plant and the skill of the fireman, and an interesting chemical process begins at once. The fresh coal absorbs heat from the hot coals beneath, during this time taking heat which would otherwise be available to the boiler. When heated to the boiling point of water, the moisture of the coal is expelled and passes off without producing any useful results. At a slightly higher temperature the gases of the coal begin to come off—combustible gases which are valuable and which give their full quota of heat when liberated under proper conditions for combustion. These gases constitute the so-called volatile matter of coal, and are perhaps the most troublesome constituents met with in endeavoring to burn coal economically.

In semi-bituminous coal, the kind used in this illustration, the volatile matter ranges from 15 to 20 per cent., while in bituminous coal it varies from about 20 to as much as 40 per cent. Coals containing the higher percentages of volatile matter require a specially designed furnace of large dimensions and a degree of skill seldom found in the average boiler-room to burn them to the best advantage.

On the other hand, semi-bituminous coal (15 to 20 per cent. volatile matter) seems to have been designed by nature for steaming purposes, as she removed a large amount of the troublesome volatile matter in preparing the coal for man's use.

To continue with our observation of the changes which are taking place in the freshly fired coal, after the volatile matter has all been distilled there is left of the coal carbon and ash. This will be found to consist of a more or less solid mass of coke. It has ignited at a temperature of about 750° F., while the volatile matter was still in process of distillation, and is now at a bright red or orange heat, and is returning to the furnace the heat required to raise it to the ignition point. This coke, less the ash, is represented in an analysis by the "Fixed Carbon." It is really the most valuable constituent of the coal. Fixed carbon ranges from 50 per cent. in bituminous coals to about 72 per cent. in semi-bituminous coals.

We may now consider our few shovelfuls of coal in approximately the same condition as the entire fuel bed, which we will examine as a whole.

Next to the grates will be observed a thin layer of ashes, pieces of which are constantly falling through the bars into the ash-pit. Immediately

above this is a layer of decrepitated coal or coke which gradually merges into an incandescent zone of white-hot coke, above which lie layers of coke and coal in various stages of combustion, according to the state of the fire.

In the example before us we have already observed that the top of the fuel bed was coked into a more or less solid mass and is burning at a bright red or orange heat. Now if we use a hoe, or other appropriate tool, to break up this coked mass a change is instantly perceivable. The fire burns at a white heat. Standing in front of the open door it is almost unbearable, and if you will look at the steam gauge you will observe that the pointer is slowly "going up." How did the breaking up of the mass of coke produce this result? Simply by making more passages for the air to come up through the grate and fuel bed.

This brings us to the question of air supply, of which there is none more important. It is, of course, well known that air is essential to combustion, but it is probably not so well known that we burn more air than coal. The proportions are something like fifteen tons of air, or more, to one ton of coal. Fortunate, isn't it, that we buy the coal and not the other equally essential element to combustion?

It is the oxygen of the air that we utilize in burning the coal, and this must be in the right proportion to the amount of coal on the grates to burn the fuel efficiently. If we supply too little air the carbon burns to a gas known as carbon monoxide, resulting in a waste of about 69 per cent. of the fuel. If we go to the other extreme and supply a large excess of air we are also wasting coal by heating that excess air to a high temperature and losing it through the stack. Carbon and oxygen combine in known definite proportions, and it is possible to calculate exactly how much air is required to burn a given amount of coal. But calculating the proper theoretical air supply for any of your plants, however simple, is a vastly different proposition from attempting to apply that information in daily practice.

There is still another way of determining how much air is required for your plant, which, however, calls for a series of tests under competent technical direction; that is by determining the flue or stack temperature and analyzing the flue gases. This data gives you the stack losses and can be used in calculating back to the amount of air which would have produced the best results. To those interested in this phase of the subject I might add that there are now to be found for sale by several instrument manufacturers so-called CO^2 recorders, which mechanically determine and record continuosly the amount of carbon dioxide which is the principal product of combustion going up the stack. With this instrument you are enabled to see what you have done after you have done it.

Without going too deeply into this scientific side of combustion, it should be remembered that it is not possible to save all of the heat which ordinarily goes up the stack, as a portion of it, where a fan or blower is not employed, is necessary to maintain the draft. A stack temperature of about 450° F. is generally considered sufficient for this purpose, under ordinary conditions.

As a general rule, the air supplied for combustion should be admitted solely through the grates, as in that way it not only comes in contact with the highly heated carbon, or coke, but the excess in passing through is heated to a sufficient temperature to enable it to combine with the volatile matter and cause that constituent to burn smokelessly and with useful results.

In our experiment, in which we learned that breaking up the fuel bed brightened the fire by admitting more air, we accomplished another result almost equal in importance. We roughly leveled off the fuel bed to a practically uniform thickness so that the air was distributed equally through all parts of it, or, in other words, the pressure was the same on each square foot of grate surface.

In contrast with this let us examine one of the furnaces which have not received proper attention and note the conditions therein.

We will probably first observe that the fire is burning more brightly on some portions of the grate than on others, while other parts of the fire appear to be black, and dead. It is quite likely the brightest portion is towards the back, or in the extreme rear, of the furnace, while the blacker portions lie just in front of the door. As our eyes become accustomed to the glare we may note that the fuel bed is thinnest where the fire is brightest, and thickest where the fire has a black, dead appearance. Now if we examine these thin places more closely we will be able to discern a short, blue flame, tinged with yellow. This indicates where the grates are almost bare. The air is rushing through these holes in the fire, and chilling the boiler, as well as rendering useless the more thickly covered portions of the grate. This is easily understood when we realize that the draft seeks the path of least resistance. When the furnace door is open it rushes in over the fire. As soon as this door is closed it seeks the easiest means of going through the fuel bed, and this, of course, is through the holes and thin places. Hence it is apparent that a fire should be kept level all over in order that it may offer a uniform resistance to the draft. Particular attention should be given to the back of the grates where less fuel is likely to be thrown by the fireman.

We have seen the necessity of keeping the fire at an even thickness all over, but we have not, thus far, considered how thick it should be. The depth of the fuel bed to be carried depends on the draft and can only be determined for each plant by experiment. It is obvious that a thicker fire may be carried with a strong draft and a thin fire must be carried with a weak draft. It is also obvious that the stronger the draft the more coal it is possible to burn in a given time. This is naturally a function of the amount of steam produced in that time, which may exceed the requirements or prove insufficient for the same. Where more steam is being made than required and the boilers have a tendency to blow off, wasting steam and coal, it will be found possible to prevent this waste by running with the dampers partly closed, which will allow a thin fire to be carried and result in a

slower rate of combustion. When the steam produced is insufficient for the requirements every effort must be made to increase the draft, by lengthening the stack if necessary, or making other changes in the plant which will produce the desired result. The boilers of a large number of our manufacturing plants are overloaded to such an extent that it is almost impossible to materially increase the steam output by any alterations in the existing equipment. The only remedy is to put in additional boilers, and if the owners of these plants appreciated that the monetary loss caused by overloaded boilers was greater than the interest and depreciation on new equipment there would be fewer of them.

Another word about firing. We have seen that it takes time for a charge of coal to heat up and become an efficient part of the fuel bed. It follows then that the more coal we put on at a time the longer the fuel bed will be delivering heat to the new charge of coal instead of to the boiler, with the result that we have a series of alternating cool and fiercely hot conditions in the furnace which are neither conducive to economy nor helpful to the life of the boiler.

Conversely, it follows that the less coal put on at a time the more uniform are the furnace conditions as well as the delivery of heat to the boiler, and while this may mean a more frequent opening of the door, which temporarily arrests the draft, there is little danger of carrying this method of firing to excess, as the physical endurance of the fireman is the controlling factor.

There are few plants today which do not in some way measure or weigh the coal daily and their managers are wont to regard the figures as a measure of the day's work. Quite likely many of you who count the number of wheelbarrows brought in each day, after having weighed one barrow as a check, have noticed wide discrepancies in summing them up for comparison with the car weights. Probably some have very humanely concluded that the car weight must be wrong.

It is quite apparent that the way a wheelbarrow is loaded, that is, whether completely filled or not, has much to do with the number of loads in a car. But, independent of this, I found by actual experiment that the check weight used is more likely to be the cause of these discrepancies. This can best be understood from a description of the experiment referred to.

I had a box of about 23 cubic feet capacity, holding approximately the same amount of coal as a wheelbarrow, placed on an accurate scale, the light or tare weight being noted. I then had the box filled with coal from a part of the pile showing practically all lumps. When this box was full it was leveled off with a plank and was found to contain 743 pounds of coal. The box was next filled with coal from another part of the pile, showing a mixture of about half lump and half fines. This was leveled off in the same way and weighed 876 pounds. The box was again filled from a part of the pile showing practically all slack or fine coal. This weighed 757 pounds.

Comparing these weights we find that there is a variation of about 8 1/2 per cent. on the same coal from the same car, due to the variation in the size of the coal weighed. Now suppose anyone of these figures is taken as the check weight. The first, 743 pounds, gives us 134 wheelbarrows per 50-ton car. The second, 876 pounds, gives us 114 wheelbarrows per 50-ton car. The third, 757 pounds, gives us 132 wheelbarrows per 50-ton car.

We conclude from this that the weight of any measure of coal is dependent upon the percentage of lump contained therein, lump weighing the lightest, slack the next lightest, and a mixture of lump and slack the heaviest. A moment's consideration will suffice to show that the heaviest weight is obtained by filling in the spaces between the compact lumps with slack; or, in other words, there is less waste space than with lump alone, or with slack, which obviously has less density than the lumps.

The only safe way to find out how much coal is being burned each day is to weigh every barrowful from every car on scales kept free from coal and in good working order. Any scheme of measuring the coal is liable to an accumulation of errors, and cannot be taken as a criterion as against the car weight which is determined in one operation on automatic, recording scales, kept in perfect adjustment and constantly inspected.

Speaking of handling coal reminds me of a simple appliance, if it may be dignified by that term, which the trimmers or stevedores employ in stowing coal aboard ship. It would seem that this could be used to good advantage and with a saving of time at plants where coal is dumped from a trestle. The trimmers always have ready for use several strips of galvanized iron, about three feet wide, and 12 to 15 feet long, having at one end a loop of heavy wire strands. These sheets are used in the following manner: When the coal begins to form into a peak, one of these strips of sheet iron is laid down the side of the pile from a short distance below the peak to the point where coal is to be stowed, and the top securely fastened by ropes leading to the wire loop. This gives a smooth, slippery surface down which the coal glides after striking the peak of the pile. It would be an easy matter to use them at your plants to carry the coal forward into the bin instead of having to shovel it forward to allow sufficient room to finish unloading a car, as is so often the case.

Having ascertained the conditions which are to be met with in the use of coal, we would now do well to look into the question of coal supplies, and particularly the characteristics and value of the different coals.

Analyses are useful in this connection and tell us the character of the coal, whether bituminous or semi-bituminous, and its heat-producing value. The percentage of volatile matter indicates the class to which a coal belongs and the calorific value stated in British Thermal Units, generally abbreviated "B.T.U." tells us its heat-producing value. Appended to the printed copies of this paper will be found a table of representative analyses which will be useful in comparing the different coals enumerated therein. This table embraces practically all of the coals which are offered to the eastern and southern cotton mill trade, and is based on the most reliable data available, the sources of which are shown.

We found in the early part of our discussion that

semi-bituminous coal was especially well adapted to boiler use. Typical examples of this coal are those known as New River and Pocahontas. Typical examples of bituminous coal are those known as Clinch Valley, Kanawha, Pittsburg and the coals of Tennessee and Alabama.

There is a vast difference in the economy of different coals, although not such a great difference in the price at the mines. A purchaser would do well to think twice before buying a poor coal because of the low mine price, for as you all know, the quotation on coal to the consumer is its price at the mine plus the freight to the consumer's mill, but the freight may have the effect of cancelling any saving due to low first cost, as will be seen presently.

Now comes the question of supplies or dealers, but few words are required to convince one of the value of a strong and trustworthy connection. Strikes, affecting both railroads and mines, come at the most inopportune time, and very often without warning, prices soar or coal may not be found on the open market at any price. At such a time a shipper with large resources will stand the best show of taking care of his regular customers. Even under normal conditions, a one- or two-mine concern may have an explosion or fire which will tie up its output for an indefinite period.

There are steam coals to be found on the market represented by private brands or trade-marks, which have a long-established reputation, built up on the superior quality of the coal. These trade-marks are naturally a highly valued asset, represent an enormous investment and prove to be a guarantee of good faith, to the consumer, as their continuance in popular favor is dependent upon maintaining the high standard of quality for which any particular trade-mark is framed. Consequently, the use of such a coal has many advantages which cannot be reduced to a matter of mere figures.

Advantages and Disadvantages of the Southern Cutter.

BY H. R. BEANE.

The necessity for volume of business, to enable a cutter to compete with national operators in this line, with lack of experienced labor, local prejudice and limited market, are its greatest drawbacks. The Southern cutter is forced to buy the majority of his raw material from Eastern commission merchants. My observation leads me to believe that this is brought about by two conditions,—lack of cooperation on the part of the mill men, and the fact that up to the present time the volume of his purchases has not been of sufficient importance to warrant consideration of the producer of the raw material. Observation also leads me to believe that these conditions are to some extent being done away with, and it will be only a matter of a short time until the cotton mills realize that one of their greatest assets, also one of their potent factors to success, is the encouragement of this industry, which will warrant them a continued demand for their product. I am speaking here from personal experience, having been a cutter of medium-priced cotton piece goods, consuming an average annual yardage of from 300,000 to 600,000 yards. Our business has yet to be sought, with possibly one or two exceptions, by any producer of these goods in the South, yet 75 per cent. of our product has been made in Southern mills, and our business has been greatly sought by Eastern commission merchants. Some two years ago we began to buy some of our goods direct, and I am sure it has been to our advantage, from the standpoint of cost, and I am thoroughly convinced that were more concerted action taken, more consideration given on the part of the mill men, and encouragement given wherever deserved and needed, that it would be only a matter of a short time until the consumption of cotton piece goods which are produced in the South would be increased to an enormous extent. Lack of information on the part of the producer, as to what purpose his product is used and who uses it, is to a large extent responsible for the inactivity on his part on this line. Positive I am that if a better understanding existed between the producers of the cloth and the manufacturer who cuts it up, their mutual financial conditions would be wonderfully improved. This is especially true of the cutters located in the fourteen Southern states. The item of freight alone, to say nothing of the delay in transportation, which is, under the most favorable conditions, very poor in our country, is an item which, taken in general amounts to an enormous annual volume, which cost is equally shared between the cutter and the producer.

In the matter of experienced labor, that primary trouble is to a very large extent being eliminated, and it has been solved by the importing of experienced people from large Eastern manufacturing centers to occupy the responsible positions connected with institutions of this character, but has never yet been a success in any plant until the education of home labor of sufficient volume for its maintenance has been perfected. The South holds the greatest natural advantage of any section of our country for the production of finished garments of medium qualities, which represent the great volume of business of this nature. The garments to which I refer are women's muslin underwear, men's fabric underwear, night shirts and pajamas, children's and misses' dresses, children's play suits, rompers, boys' shirtwaists and men's shirts. Up to a few years ago it was generally conceded that, on account of the water for laundry purposes, it was impossible to make a first-class sightly man's shirt outside of the East, but within the past two years this idea has been completely abandoned. This has been brought about by the improvement in the machinery used for this purpose, and today there is being made in the South, and sold throughout the United States, shirts which compare very favorably with any shirts manufactured in this country, and have succeeded in getting recognition from the most critical buyers that we have.

Men's fabric underwear, or what is sometimes called "athletic underwear," and which is, comparatively speaking, a new idea, is consuming annually millions of dollars worth of piece goods,

and I am sure that from inspection of all garments of this character made, that 65 per cent. of this cloth is made in the South, while comparatively none is bought direct. This business, which is only five years old, is today, at the smallest calculation, speaking from a national standpoint, a forty-million-dollar industry, and the surface has only been scratched, for it is generally conceded by the students of men's wear that it is a revolution of men's underwear business. This is specially true of the Southern country, where summer underwear is used at least nine months in the year. The Southern cutter, as a national producer, has not yet appeared, nor will he ever be developed until he learns to take advantage of his natural opportunities and becomes broad-gauged enough to invade the large markets of the Middle West and the East. There are numerous articles which could be manufactured in the South, where we have comparatively no labor troubles, at a saving in cost of manufacturing of from 15 to 20 per cent. over the congested manufacturing districts of the East in which are located all the big producers.

Our organization, the Peter Hill Company, of Atlanta, manufactures men's neckwear, athletic underwear, night shirts and pajamas, and speaking from a comparative standpoint, is very small, but our product is being sold direct today in twenty-seven states, and we have had no trouble in interesting the most critical buyers in any market in which we have undertaken to place our articles, and the expansion of our businss has been limited only to our ability to produce.

Children's and misses' dresses have, in the past few years, become quite a factor in the manufacturing business, and we have, located in the South today, a few plants of this character, all of which are in a very prosperous condition. The great volume of goods used in the construction of these articles is, of course, print cloths, although quite a few white goods are consumed. The business character of the people connected with this industry assures its success from the standpoint of development.

Another item which is claiming universal attention is children's rompers or play suits. These are constructed from cloths similar to the children's and misses' dresses, and like the industry to which I have just referred, is an idea which is only two or three years old.

Woman's muslin underwear has never been successfully manufactured in the South, although it has been undertaken numerous times. The only plausible excuse which I can offer for this failure is the fact that the manufacturers of this line necessarily have to compete with plants which run upon an enormous scale, and the cost of production in the large plants is so much smaller than can possibly be obtained in the small one that it has at all times placed them in the position where they have been unable to meet competitors on a price basis, and that has forced the inevitable result to which I have referred. On account of the great volume of business done in this particular line, I am thoroughly convinced that when manufacturers of experience and ability recognize the importance of this section, from a manufacturing standpoint, this will be the first large industry to claim their attention. It will necessarily have to be run upon a large scale, and it will have to have a national distribution, but with such there can be no doubt of its tremendous success.

Warehousing Cotton in the South.

BY L. H. BULLARD.

In the preparation of my remarks on the warehousing of cotton in the South, I have conferred with a number of my associates in business. One of them suggested to me that my paper be prepared from this point of view, viz.: How would I spend two and a half million dollars turned over to me for the purpose of inaugurating a system of warehouses for the storage and handling of cotton preparatory for shipment in the cotton-growing states, with a view of protecting the staple, and preserving every economy for promoting the interest of both the producer and the consumer?

It was suggested that I bear in mind the fact that a professional warehouse company or warehouseman is, in a certain sense, a public servant. It is not a company or individual engaged in the selling of cotton or in the selling of a manufactured article, yet, in the nature of a salesman—selling his services. And I am mindful of the fact that there can be no rightful or sound selling of anything unless it is beneficial to the buyer as well as to the seller. Therefore, from this point of view, I am expected to recommend a system of warehousing and handling cotton which will not only be remunerative to the investment interest I am representing, but profitable as well to my patrons.

As I see and understand the situation, there are two kinds of warehouses needed in the cotton-growing states.

First—A warehouse for the shippers of cotton, formed of platforms covered with sheds,—inexpensive properties from the standpoint of construction, yet built in a manner to obtain a maximum service for the shippers at a minimum cost; a warehouse for the quick handling of cotton in and out; a warehouse which yields a reasonable profit to the investor; one, however, that does not in any way affect the shippers interest with respect to insurance under a marine cover.

Second—Warehouses for farmers, merchants, factors and others who hold cotton and who use the regular fire insurance covers instead of marine contracts. These warehouses should be of brick, concrete, or other fireproof construction, with automatic sprinklers. and so arranged as to carry the minimum insurance rate, or at a rate not exceeding twenty-five cents per annum on each one hundred dollars in value; a rate, say of one or two cents per bale per month.

Each warehouse plant should be provided with the two kinds of facilities described. And these warehouses should be located at designated points most convenient to the cotton trade.

The location of warehouses at concentrating points is necessary for a number of reasons, of which I will mention two:

First—The cotton should be at a point where there is strong buying competition, in order to realize the maximum price on a moment's notice.

Second—Volume is required in order to obtain a strong, reliable organization and management, and at the same time minimize the cost of handling.

At present, the warehouses at each concentrating point would probably have to be equipped with a compress machine. There are many gin compresses now in operation throughout the cotton-growing states, and more are being installed every year. But it is necessary, even for gin-compressed cotton, to be assembled at some concentrating point for re-shipment, in order to realize the maximum prices. In fact, gin-compressed cotton, with a few possible exceptions, is now being assembled at concentrating points for re-shipping purposes, just the same as the uncompressed bales, the difference being that such cotton, having already been compressed at the gin, it is not again compressed when it goes forward from the concentrating point, thus avoiding the expense of compressing at that point.

We cannot obtain, in any system of warehousing of cotton in the South, the maximum results at a minimum cost without a close co-operation on the part of the carriers.

The location of warehouses of any system will necessarily have to be fixed or controlled by the carriers, for the reason that cotton cannot be economically handled without the concentrating and re-shipping privileges, with which privileges all interested are familiar. The present compress points, and such as it may be advisable to establish from time to time, seem to be the best places for the construction and maintenance of the character of warehouses needed by the trade. Practically all of the compress companies at compress points today have the kind of facilities needed for the shippers, namely: the facilities for the quick handling of cotton in and out, as I have before referred to.

I have here an illustrative picture of what I mean in speaking of concentrating points:

Memphis, Tennessee, is the heart of the Mississippi Valley. Memphis, you will note, is located at the point of intersection of three states—Tennessee, Arkansas and Mississippi. It is estimated that about eight hundred thousand bales of cotton are grown within a radius of one hundred miles at Memphis. This map shows twenty-one concentrating and re-shipping points within the hundred-mile radius, taking Memphis as a center and including Memphis. At these twenty-one points cotton is cencentrated for re-shipment under well-defined, yet equitable, rules and regulations promulgated by the carriers, each point now handling cotton through its present facilities in quantity about as follows:

	Bales.
Memphis, Tenn.	600,000
Jackson, Tenn.	20,000
Newport, Ark.	55,000
Tupelo, Miss.	55,000
Grenada, Miss.	32,000
Helena, Ark.	75,000
Holy Springs, Miss.	25,000
Okolona, Miss.	21,000
Clarksdale, Miss.	75,000
Paragould, Ark.	15,000
Osceola, Ark.	20,000
Corinth, Miss.	50,000
Covington, Tenn.	50,000
Rosedale, Miss.	25,000
Dyersburg, Tenn.	35,000
Brownsville, Tenn.	20,000
New Albany, Miss.	25,000
Como, Miss.	20,000
Houston, Miss.	20,000
Forest City, Ark.	25,000
Cotton Plant, Ark.	15,000
Total	1,278,000

At Memphis there are the two kinds of facilities for shippers, factors, etc., that I have described, and in a measure some of the other points have the character of facilities mentioned.

There are no monopolistic features connected with this plan of warehousing cotton. To illustrate:

First—Memphis draws cotton at times from points beyond the hundred-mile radius; but the Memphis trade, with exceptional cases, is not allowed concentrating or re-shipping privileges on shipments arriving at Memphis from or past other concentrating points. This trade Memphis draws largely on account of its big market, and on account of the advances made by her merchants and factors for the raising of the crop. Furthermore, Memphis has the character of warehousing facilities especially suitable for holding cotton, which is attractive.

Second—(a) The general rule is that cotton grown between any two concentrating points can be handled, at the option of the owner, at either of those two points, and it frequently happens that it can be handled at three or more concentrating points to equal advantage, insofar as the rates from point of origin to final destination are concerned.

(b) Cotton grown between Covington and Dyersburg, Tenn., a distance of thirty-nine miles, can be concentrated at either Covington or Dyersburg for re-shipment, and handled on a basis of the through rate from point of origin to final destination. In some instances there are exceptions to this rule, and cotton is hauled past one, and sometimes two, concentrating points to another, but for this there are usuallly good reasons, satisfactory to the trade.

(c) Cotton grown between Rosedale, Miss., Clarksdale, Miss., Helena, Ark., and Memphis, Tenn., with a few possible exceptions, can be concentrated at either of the four points under a re-shipping rate satisfactory to the trade. And so on throughout the entire territory described in the one-hundred-mile circle.

Third—The concentrating points are fixed by the carriers through published freight tariffs filed with our state and interstate railroad commissions.

Fourth—There are no exclusive patents available for any warehouse system or plan of handling cotto Any man or set of men, can duplicate any

plant that we could build, and could operate it.

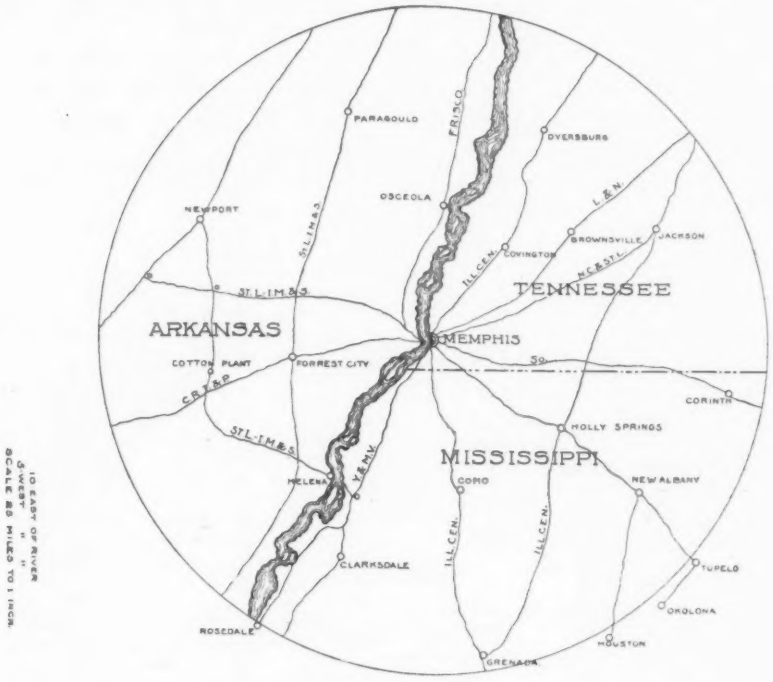
It will be seen from the foregoing illustration that the co-operations of the carriers is necessary for the proper and economical warehousing of cotton.

It is my opinion that this, or any other system of warehousing cotton, must have, for the present at least, an incidental compression feature attached to it. That the warehousing and handling of cotton, on the whole, should be reduced to a scientific basis and conducted by those who can qualify by reason of age and experience as professional warehousemen and handlers of cotton. That the cotton trade should be interested in the warehousing companies, but that these warehousing companies should not be under the sole control of the handlers of cotton. This seems necessary in order to establish universal loan values to warehouse cotton receipts.

The warehouse company should be of sufficient financial strength to make it unnecessary to bond its receipts. There should be uniformity of rules and regulations for the government of its officers and employes at all points in the various states, and the officers and employes who are issuing negotiable or quasi-negotiable documents should be placed under a large bond, which bond should protect the company against any act, default or neglect on the part of the employe in the conduct of his business.

To make clearer my meaning: The rules of the company should provide that receipts for cotton shall be given only when the cottan is actually in its possession. That "good order" receipts shall not be given for cotton in a damaged condition. That cotton shall not be delivered until the outstanding receipt has been surrendered and cancelled,—and so on. Then, so draft your bond as to protect the company against any claims arising through failure of the officers or employes to comply with these rules.

Agents of transportation companies, banks and shippers should be furnished with the signatures of employes authorized to sign warehouse cotton receipts, coupled with a request that if receipts



signed by other parties are presented such receipts shall be recognized as not genuine.

In conclusion, I beg leave to refer to the fact that there are a large number of small towns in the cotton-growing states shipping anywhere from five hundred to five thousand bales of cotton per annum. At such points it would not pay to invest in warehouse properties of the character mentioned, as the tariff of charges on a small volume of business would necessarily have to be, comparatively speaking, very high. And the amount of cotton would be insufficient to cause buyers to locate at these small points, other than through local representatives, who would have to be paid, further increasing the handling expenses. Again, skilled and experienced handlers and warehousemen of cotton are not today available for these small points, even if the cotton trade were willing to patronize warehouses at such locations and pay the charges necessary in order to obtain their services.

Recent Textile Patents.

COMBING MACHINES. Spindle Support for Rollers of. 957,921. Alfred W. Whitehead, Leeds, England.

DYEING MACHINE. 955,993. John T. Psarki, Cleveland, O.

DYEING MACHINE. 957,801. Joseph Richardson and Jacob F. Neff, Philadelphia, Pa.

DRYING TEXTILE and Other Materials. Apparatus for. 958,469. Adolf Boleg, Rorschach, Switzerland.

FABRIC FEEDING Roll or Head. 956,408. William B. Palmer, Greenwich, N. Y.

FABRIC SUPPORTING Reel. 957,991. George T. McLeod, Dedham, Mass.

KNITTING MACHINE. 956,820. George T. Nicholls, Providence, R. I.

KNITTING MACHINE Needle. 956,318. George C. Egly, Philadelphia, Pa.

KNITTING or Weaving Device. Hand. 957,711. Alice Putnam, Chicago, Ill.

KNITTED SWEATER. 957,854. Max A. Mueller, Brooklyn, N. Y.

LOOM PICKER Stick Check. 957,047. Sayers D. Eubansm, Durham, N. C.

LOOM TEMPLE. 956,725. Jonas Northrop, Hopedale, Mass.

LOOM. Filling Replenishing. 956,726. Jonas Northrop, Hopedale, Mass.

LOOM. Narrow Ware or Ribbon. 958,703. Elbridge R. Holmes, Worcester, Mass.

LOOM SHEDDING Mechanism. 956,980. Peter Labonte, Fall River, Mass.

LOOM. Henry Cote, West Warren, Mass.

LOOM TAKE-UP Motion. 958,597. William H. Clegg, Burnley, England.

LOOM SHUTTLE Binder. 958,487. Albert A. Gordon, Worcester, Mass.

LOOM. 957,615. Joseph E. Lemyre, Manchester, N. H.

LOOM PICKING Motion. Vertical. 957,725. Robert Abell, Uttoxeter, England.

LOOMS. Drop-shuttle Box Mechanism of. 958,688. Eugene H. Ballou, Pawtucket, R. I.

LOOMS. Law for Narrow Ware. 956,854. Elbridge R. Holmes, Worcester, Mass.

LOOMS. Compass Board for. 956,321. Carl Engsberg and John B. Engsberg, West Hoboken, N. J.

LOOMS. Thin Place Detecting Means for. 956,172. Alonzo E. Rhoades, Hopedale, Mass.

LOOMS. Thin Place Detecting Mechanism for. Sayers D. Eubanks, West Durham, N. C.

SPINNING MACHINES. Stop Motion Mechanism for. 957,453. Oscar Agel and Charles F. Isleib, Paterson, N. J.

SPINNING or Twisting Machines. Thread Board for. 956,248. Annie A. Whittum, Fall River, Mass.

SPINNING RING. 956,930. Edward A. Brigham, Grafton, Mass.

SPINNING RING. 957,759. Charles S. Forbes, Boston, Mass.

SPOOL. 956,284. Joseph D. Chaffee, Willimantic, Conn.

THREAD TRIMMING Mechanism. 957,265. Harris W. Slater, Lake Mahopac, N. Y.

WEAVING. Pattern Mechanism for. 956,510. George Beaumont, Dunedin, New Zealand.

YARN and the Like. Apparatus for Opening and Separating Threads of. 957,610. James Keith and William W. Wardle, London, Eng.

Recent Textile Trade Marks Registered.

"Daurhoff." Hosiery. Regal Shoe Co., Boston, Mass.

"Arrow Brand." Handkerchiefs. H. Rosenthal & Co., New York.

"Madame Butterfly." Woven and printed silks. M. C. Migel & Co., New York.

"Diplomat." All kinds of shirts. Harris-Lipsitz Co., Dallas, Tex.

"Iron Trail." Work shirts, jumpers and overalls. Louis Lewin, Chicago, Ill.

"Ripplette." Cotton piece goods. Bliss, Fabyan & Co., Boston, Mass.

"Defenders." Undershirts, drawers and union suits. High Rock Knitting Co., Philmont, N. Y.

"Gold Bond." Handkerchiefs. Moses Isaacs, New York.

"Cobweb." Hosiery. Thos. E. Brown, Philadelphia, Pa.

"Paul Jones." Blouses and jumpers. Morris & Co., Baltimore, Me.

"Sovereign." Ribbons. The H. B. Claflin Co., New York.

"Madison Square." Men's waistcoats. Currick, Leiken & Bandler, New York.

"NB." Hosiery. Neustadter Bros., San Francisco, Cal.

"Alamo." Hosiery. Harris-Lipsitz, Dallas, Tex.

"Waterproof Cloth." H. W. Fleddermann Co., Louisville, Ky.

Leigh & Butler.

Announcement is made that the business of Evan Arthur Leigh will hereafter be conducted under the firm name of Leigh & Butler, Mr. A. C. Butler, a nephew of Mr. Leigh's, who has been connected with the business for a number of years, having been admitted to partnership. The firm will continue to be sole agents in the United States and Canada for Messrs. Platt Bros. & Co., Ltd., the largest builders in the world of cotton, woolen and worsted machinery, also for Mather & Platt, Ltd., builders of dyeing and finishing machinery, the Patent Automatic Feeding Machine Co., Ltd., Joseph Sykes Bros., cotton card clothing manufacturers, James Critchley & Sons, card clothing for woolen and worsted, Wilson Bros. Bobbin Co. and many other foreign builders of machinery and dealers in supplies.